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DIRECTORATE OF MANPOWER ANALYSIS

PROJECT REPORT 649

AN EXAMINATION OF OFFICER RETENTION AND CAREER PROGRESSION ACCORDING TO DIFFERENT COMMISSIONING PLANS WITHIN THE CANADIAN FORCES

VOLUME I: OVERALL RESULTS

by

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ABSTRACT

The Minister of National Defence created the "Committee on the Canadian Military Colleges" to examine the return on investment for the Canadian Forces (CF) of the Canadian Military College (CMC) system. The Directorate of Manpower Analysis was tasked to analyze officer career progression and retention in specific military occupations with particular attention to whether the officer attended a CMC.

The promotion characteristics and retention profiles for CF officers are examined in this project report according to the commissioning plan by which the serving officer joined the regular force component. In addition, graduates under the regular officer training plan from the CMC system are compared against those that have attended civilian universities.

This project report is broken into three volumes. Volume I contains the detailed analysis of CF officers as a whole followed by a discussion on the overall study results. Volume II contains the detailed analysis of each of the MOC groups examined, and Volume III contains the detailed analysis of each of the individual MOCs studied.

RÉSUMÉ

Le ministre de la défense nationale a mis sur pied "le comité ministériel sur les Collèges militaires du Canada" afin d'examiner l'apport aux Forces canadiennes (FC) du système des collèges militaires. La Direction de l'Analyse des Effectifs dut analyser la progression de carrière des officiers et leur rétention dans certaines occupations en prenant soin de distinguer les officiers gradués des collèges militaires.

Dans ce rapport de projet les tendances dans les taux de promotion et les caractéristiques de rétention dans les FC sont examinées selon les programmes de formation pour officiers de la force régulière. De plus, une comparaison est faite entre les officiers gradués des universités civiles et ceux des collèges militaires.

Ce rapport de projet est divisé en trois volumes. Volume I contient l'analyse détaillée sur les officiers des FC suivi d'une discussion sur les résultats globals de l'étude. Volume II contient l'analyse détaillée de chaque regroupement de GPM, et Volume III porte sur l'analyse détaillée des GPM individuels.

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TERMINOLOGY

For the purposes of this report, the following definitions apply:

Attrition Rate: A ratio, the numerator consisting of all releases from the trained strength of a group of officers in the Canadian Forces (CF) within a period; the denominator consisting of the trained effective strength of that group at the beginning of the period.

Canadian Military Colleges: The system of military colleges in Canada that consists of: the Royal Military College (RMC) in Kingston, Ontario; Royal Roads Military College (RRMC) in Victoria, British Columbia; and le Collège Militaire Royal (CMR) de Saint-Jean, Québec.

Eligibility Rate: A ratio, the numerator consisting of all individuals eligible for promotion out of a given rank; the denominator consisting of the total for that rank. It is calculated at a specific point in time.

Experience Profile: The distribution of the trained effective strength of a group of officers in the CF by years of commissioned service or by years of service.

Promotion Rate: A ratio, the numerator consisting of the number of officers promoted out of a given rank within a period; the denominator consisting of the eligible strength at the beginning of the period.

Retention Profile: A graph that depicts the survival probability of a group of officers as a function of experience measured by years of commissioned service or by years of service.

Time in Previous Rank Profile: Within the specific officer group being examined, it is the distribution of the strength of that group by the time spent in the previous rank.

Time in Rank Profile: Within the specific officer group being examined, it is the distribution of the strength of that group by the time spent in the current rank.

ABBREVIATIONS

AERE	Aerospace Engineering - MOC 41
ADM(Per)	Assistant Deputy Minister (Personnel)
air ops	Air Operations
ANAV	Air Navigator - MOC 31
ARMD	Armoured - MOC 21
ARTY	Artillery - MOC 22
ATC	Air Traffic Control - MOC 63
AWC	Air Weapons Control - MOC 64
Capt	Captain
Capt(N)	Captain (Navy)
CELE	Communications and Electronic Engineering - MOC 42
Cdr	Commander
CF	Canadian Forces
CFR	Commissioned From the Ranks
CMC	Canadian Military Colleges
CMR	Collège Militaire Royal
Col	Colonel
CPRM	Chief Personnel Policy Planning and Resource Management
CRA	Compulsory Retirement Age
DEO	Direct Entry Officer
DEOD	Direct Entry Officer with a Degree
DEOP	Direct Entry Officer with a Diploma
DGPP	Director General Personnel Policy
D Man A	Directorate of Manpower Analysis
DND	Department of National Defence
FRP	Forces Reduction Plan
Gen	General
HG	Harvard Graphics (Registered Trade Mark)
IE	Intermediate Engagement
INF	Infantry - MOC 23
INT	Intelligence - MOC 82
IPS	Indefinite Period of Service

ABBREVIATIONS (Cont.)

LCdr	Lieutenant-Commander
LCol	Lieutenant-Colonel
LDO	Limited Duty CFR Officer
LEME	Land Electrical and Mechanical Engineering - MOC 43
LOG	Logistics - MOC 69
Lt	Lieutenant
Lt(N)	Lieutenant (Navy)
Maj	Major
MARE	Maritime Engineering - MOC 44
MARS	Maritime Surface and Sub-Surface - MOC 71
MCMC	Ministerial Committee on the Canadian Military Colleges
MILE	Military Engineering - MOC 45
MND	Minister of National Defence
MOC	Military Occupation
MPIS	Military Personnel Information System
NCM	Non-Commissioned Member
NDHQ	National Defence Headquarters
OCDP	Officer Career Development Plan
OCTP	Officer Candidate Training Plan
OCTPC	Officer Candidate Training Plan from Civilian Status
OCTPM	Officer Candidate Training Plan from Military Status
OPI	Office of Prime Interest
PADM	Personnel Administration - MOC 68
PLT	Pilot - MOC 32
RETP	Reserve Entry Training Plan
RMC	Royal Military College
ROTP	Regular Officer Training Plan
RRMC	Royal Roads Military College
SE	Short Engagement
SEC	Security - MOC 81

ABBREVIATIONS (Cont.)

TIR	Time in Rank
TIPR	Time in Previous Rank
UTPM	University Training Plan for Non-Commissioned Members
YCS	Years of Commissioned Service
YOS	Years of Service

LIST OF REFERENCES

1 NDHQ Action Directive D1/93 dated 5 Jan 93.

2 Exec Dir Memorandum 1150-110/M88 to the Chief Personnel Policy Planning and Resource Management (CPRM) dated 19 Jan 93, with a minute to the Director General Personnel Policy (DGPP) on 21 Jan 93, and to D Man A on 22 Jan 93.

3 Operational Research and Analysis Establishment Project Report No. 522, CF OFFICER ATTRITION REVIEW, by Ms. G.A. Bossenmaier, Mr. T.A. Ewashko and Col A.C. Platz, dated July 1990, (UNCLASSIFIED).

4 Operational Research and Analysis Establishment Directorate of Manpower Analysis Staff Note 3/90, AN EXAMINATION OF THE STRUCTURE AND BEHAVIOUR OF ATTRITION WITHIN THE CANADIAN FORCES IN THE OFFICER OCCUPATIONS OF AIR NAVIGATOR AND AIR TRAFFIC CONTROLLER, by Capt A.D. Lee, dated August 1990, (UNCLASSIFIED).

5 Operational Research and Analysis Establishment Directorate of Manpower Analysis Staff Note 2/91, AN EXAMINATION OF THE STRUCTURE AND BEHAVIOUR OF ATTRITION WITHIN THE CANADIAN FORCES IN ENGINEERING OFFICER OCCUPATIONS, by Mr. T.A. Ewashko, Capt A.D. Lee and Mr. A.C. Platz, dated April 1991, (UNCLASSIFIED).

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EXECUTIVE SUMMARY

1. The ultimate purpose of the study for the Ministerial Committee on the Canadian Military Colleges (MCMC) was to determine the career progression of officers from the Canadian Military Colleges (CMC) relative to other officers in the Canadian Forces (CF). Because of the complexities of CF service, this examination has been expanded to look at the progression and retention of all officers by their commissioning plan--whatever it may have been. Officers from the CMC are a sub-set of those officers that joined through the regular officer training plan (ROTP), so ROTP officers as a whole have been compared against others that entered some other way. The other sub-set of ROTP officers are those that took their education through civilian universities. This sub-set was compared, not only against their CMC counterparts, but also against the other group that received a civilian university education--the direct entry officer (DEO) with a degree (DEOD).

2. A detailed discussion comparing the results for the officer corps with those for various military occupation (MOC) groups and individual MOCs is contained in Volume I of this report. Growth in trained effective officer strength within the CF has been achieved mostly through ROTP and DEO commissioning plans. ROTP growth has been mainly due to the increased numbers of officers from the CMC. The representation of officers from the CMC increased with the capacity and the attraction of the CMC following an expansion in degree-granting authority. Officers now can graduate from any of the three colleges with a degree recognized by academia.

3. Generally, the analysis indicates that there have been significant differences between commissioning plans with

respect to promotion rates. Promotion rates have been generally higher for ROTP officers as compared with those for officers commissioned through either the officer candidate training plan (OCTP) or DEO. Statistical tests comparing promotion rates for ROTP graduates from CMCs and civilian universities did not show significant differences.

4. Retention patterns are influenced by such factors as obligatory service, generally low attrition during intermediate engagement (IE) and increased attrition as officers approach compulsory retirement age (CRA). Notwithstanding, the analysis shows that officers commissioned through OCTP generally have had better retention. In a comparison of CMC and civilian university graduates, retention for CMC officers has been generally better.

AN EXAMINATION OF OFFICER RETENTION AND CAREER PROGRESSION ACCORDING TO DIFFERENT COMMISSIONING PLANS WITHIN THE CANADIAN FORCES
VOLUME I: OVERALL RESULTS

PART I - INTRODUCTION

BACKGROUND

1. In 1876 the Royal Military College (RMC) in Kingston Ontario, opened as the first of the Canadian Military Colleges (CMC). In 1948 Royal Roads Military College (RRMC), a Royal Canadian Navy institution in Victoria British Columbia, joined the CMC system when it accepted cadets from the other two services. Le Collège Militaire Royal (CMR) de Saint-Jean Québec became the third jewel in the CMC crown in 1952 when it joined the CMC system under the auspices of the Royal Canadian Air Force. A degree-granting charter was bestowed on the RMC by Ontario in 1959, RRMC obtained its charter from British Columbia in 1975 and Québec conferred degree-granting status to CMR in 1986.

2. The role of the CMC within the Department of National Defence (DND) is to educate and train officer cadets and commissioned officers for a career in the Canadian Forces (CF). The majority of officer cadets attending the CMC do so under the regular officer training plan (ROTP). The remainder are enroled under the reserve entry training plan (RETP) and the university training plan [non-commissioned members (NCM)] (UTPM).

3. On 17 December 1992 the Minister of National Defence (MND) created the "Committee on the Canadian Military Colleges" (MCMC) to examine the return on investment of the

CMC system. A subsequent directive (Reference 1) appointed the Assistant Deputy Minister (Personnel) (ADM(Per)) as the Departmental office of prime interest (OPI). Following a meeting with the Executive Director for the MCMC on 18 January 1993, the Directorate of Manpower Analysis (D Man A) was tasked (Reference 2) with providing an analysis of both officer retention and career progression rates in specific military occupations (MOC) according to the various CF commissioning plans; with specific attention to whether the officer attended CMC.

4. The MCMC requested that an initial analysis of retention be completed by 12 February 1993, with final analysis of promotion rates and of retention to be completed by mid-March. Following an extension to the MCMC mandate, D Man A also received an extended deadline.

AIM

5. The aim of this study was to provide the MCMC with an analysis of officer career progression and retention by commissioning plan. This report documents the results of this analysis.

SCOPE

6. While the MCMC initially wished to examine the status of graduates of the CMC system, these individuals had to be examined in the context of all officers commissioned in the CF. The commissioning plans analyzed in this study therefore included:

a. ROTP (these officers obtain a degree while in the CF);
b. direct entry officer (DEO) with a degree (DEOD) (these officers obtain a degree before joining the CF);
c. DEO with a diploma (DEOP) (these officers obtain a diploma before joining the CF);
d. officer candidate training plan (OCTP) from military status (OCTPM) and from civilian status (OCTPC) combined;
e. UTPM;
f. commissioned from the ranks (CFR); and
g. others (consisting mainly of unknowns, of limited duty CFR officers (LDO), and of specialist officer commissioning plans).

For the purposes of this study, tha major commissioning plans include ROTP, DEO and OCTP, while all other commissioning plans are considered as minor plans.

7. The MCMC also identified several MOCs for individual assessment:

a. armoured (ARMD) - MOC 21;
b. artillery (ARTY) - MOC 22;
c. infantry (INF) - MOC 23;
d. air navigator (ANAV) - MOC 31;
e. pilot (PLT) - MOC 32;
f. aerospace engineering (AERE) - MOC 41;
g. communications and electronic engineering (CELE) - MOC 42;
h. land electrical engineering (LEME) - MOC 43;
j. maritime engineering (MARE) - MOC 44;
k. military engineering (MILE) - MOC 45;
m. air traffic control (ATC) - MOC 63;

n. air weapons control (AWC) - MOC 64;

o. personnel administration (PADM) - MOC 68;

p. logistics (LOG) - MOC 69;

q. maritime surface and sub-surface (MARS) - MOC 71;

r. security (SEC) - MOC 81; and

s. intelligence (INT) - MOC 82.

8. These MOCs were also combined into groups for study:

a. all officers;

b. operational MOCs - MOCs 21, 22, 23, 31, 32 and 71;

c. naval MOCs - MOCs 44 and 71;

d. combat arms - MOCs 21, 22 and 23;

e. air operations - MOCs 31 and 32;

f. engineers - MOCs 41, 42, 43, 44 and 45;

g. non-maritime engineers - MOCs 41, 42, 43 and 45;

h. support MOCs - MOCs 68 and 69;

j. minor MOCs - MOCs 63, 64, 81 and 82;

k. air controllers - MOCs 63 and 64;

m. security and intelligence - MOCs 81 and 82;

n. a combination of all those MOCs identified for individual examination; and

o. a combination of all other MOCs not included above.

9. A detailed examination was made of CF officers as a whole, followed by the MOC groups and individual MOCs which contain CMC graduates in sufficient numbers for analysis. The strength of the population and the distribution by commissioning plan were first inspected, then an examination of the ROTP - CMC/civilian university composition was conducted, followed by an analysis of:

a. eligibility rates;
b. promotion rates; and
c. retention.

10. The methodology used in the data extraction and analysis is outlined in Annex A to this volume. Volume I also contains the detailed analysis of CF officers as a whole followed by a discussion of the results for all of the MOC groups and individual MOCs which contain CMC graduates in sufficient numbers. Volume II of this report contains the detailed analysis of each of the MOC groups listed in paragraph 8 which were sufficiently large to warrant discussion; and Volume III contains the detailed analysis of each of the individual MOCs identified at paragraph 7 which again were large enough for analysis.

PART II - RESULTS

CF STRENGTH AND ROTP - CMC/CIVILIAN UNIVERSITY SPLIT

11. **Tables 1 and 2** summarize the trained effective strength of officers in various commissioning plans by individual MOC and MOC group as of the first of January in 1978 and 1993. Having looked at the total officer strength and how it changed relative to the various commissioning plans, it was necessary to focus next on the ROTP, and break it into CMC and civilian university components. The 1978 and 1993 ROTP strengths are shown in **Tables 3 and 4**.

Table 1: Trained Effective Strength as of 1 Jan 78
(Minus Extensions)

MOC	ROTP	DEO	OCTP	CFR	UTPM	OTHER	TOTAL
ARMD - 21	145	58	114	17	2	0	336
ARTY - 22	99	56	177	22	1	0	355
INF - 23	207	125	362	53	1	0	748
ANAV - 31	209	130	480	21	7	0	847
PLT - 32	464	339	1,036	4	6	1	1,850
AERE - 41	326	82	11	192	73	0	684
CELE - 42	315	106	82	209	92	0	804
LEME - 43	160	62	10	71	5	0	308
MARE - 44	165	50	24	177	16	0	432
MILE - 45	281	83	4	96	13	0	477
ATC - 63	24	67	91	68	8	0	258
AWC - 64	7	23	60	93	2	0	185
PADM - 68	0	0	0	0	0	0	0
LOG - 69	457	241	321	215	118	0	1,352
MARS - 71	235	120	234	67	25	0	681
SEC - 81	40	25	54	73	12	0	204
INT - 82	0	0	0	0	0	0	0
Other	162	616	109	255	54	254	1,450
TOTAL	3,296	2,183	3,169	1,633	435	255	10,971
MOC Group	ROTP	DEO	OCTP	CFR	UTPM	OTHER	TOTAL
All Ops	1,359	828	2,403	184	42	1	4,817
Naval MOCs	400	170	258	244	41	0	1,113
Combat Arms	451	239	653	92	4	0	1,439
Air Ops	673	469	1,516	25	13	1	2,697
Engineers	1,247	383	131	745	199	0	2,705
Non Mar Eng	1,082	333	107	568	183	0	2,273
Air Contl	31	90	151	161	10	0	443
SEC/INT	40	25	54	73	12	0	204
Minor	71	115	205	234	22	0	647
Support	457	241	321	215	118	0	1,352

Table 2: Trained Effective Strength as of 1 Jan 93 (Minus Extensions)

MOC	ROTP	DEO	OCTP	CFR	UTPM	OTHER	TOTAL
ARMD - 21	160	85	181	15	4	3	448
ARTY - 22	151	113	250	16	6	2	538
INF - 23	304	164	447	33	10	6	964
ANAV - 31	282	134	340	3	5	1	765
PLT - 32	560	496	872	0	4	3	1,935
AERE - 41	608	108	6	93	95	6	916
CELE - 42	483	199	40	87	108	19	936
LEME - 43	252	126	9	32	14	11	444
MARE - 44	440	217	7	41	46	8	759
MILE - 45	337	152	6	50	16	6	567
ATC - 63	33	80	144	27	9	10	303
AWC - 64	30	66	177	20	3	11	307
PADM - 68	79	117	28	57	23	9	313
LOG - 69	560	564	156	133	152	27	1,592
MARS - 71	329	238	443	21	13	5	1,049
SEC - 81	45	46	28	23	24	6	172
INT - 82	39	30	49	4	18	3	143
Other	278	750	53	73	88	331	1,573
TOTAL	4,970	3,685	3,236	728	638	467	13,724
MOC Group	ROTP	DEO	OCTP	CFR	UTPM	OTHER	TOTAL
All Ops	1,786	1,230	2,533	88	42	20	5,699
Naval MOCs	769	455	450	62	59	13	1,808
Combat Arms	615	362	878	64	20	11	1,950
Air Ops	842	630	1,212	3	9	4	2,700
Engineers	2,120	802	68	303	279	50	3,622
Non Mar Eng	1,680	585	61	262	233	42	2,863
Air Contl	63	146	321	47	12	21	610
SEC/INT	84	76	77	27	42	9	315
Minor	147	222	398	74	54	30	925
Support	639	681	184	190	175	36	1,905

Table 3: ROTP - 1 Jan 78 Trained Effective Strength (Minus Extensions)

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	99	46	0	145
ARTY - 22	55	43	1	99
INF - 23	124	80	3	207
ANAV - 31	122	87	0	209
PLT - 32	279	182	3	464
AERE - 41	200	126	0	326
CELE - 42	191	124	0	315
LEME - 43	97	63	0	160
MARE - 44	106	58	1	165
MILE - 45	181	100	0	281
ATC - 63	13	11	0	24
AWC - 64	3	4	0	7
PADM - 68	0	0	0	0
LOG - 69	235	220	2	457
MARS - 71	146	76	13	235
SEC - 81	18	22	0	40
INT - 82	0	0	0	0
Other	34	128	0	162
TOTAL	1,903	1,370	23	3,296
MOC Group	CMC	Civ U	Unknown	TOTAL
All Ops	825	514	20	1,359
Naval MOCs	252	134	14	400
Combat Arms	278	169	4	451
Air Ops	401	269	3	673
Engineers	775	471	1	1,247
Non Mar Eng	669	413	0	1,082
Air Contl	16	15	0	31
SEC/INT	18	22	0	40
Minor	34	37	0	71
Support	235	220	2	457

Table 4: ROTP - 1 Jan 93 Trained Effective Strength (Minus Extensions)

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	111	42	7	160
ARTY - 22	110	39	2	151
INF - 23	229	62	13	304
ANAV - 31	193	79	10	282
PLT - 32	417	121	22	560
AERE - 41	500	96	12	608
CELE - 42	364	111	8	483
LEME - 43	201	51	0	252
MARE - 44	329	81	30	440
MILE - 45	279	54	4	337
ATC - 63	21	10	2	33
AWC - 64	17	13	0	30
PADM - 68	55	24	0	79
LOG - 69	352	198	10	560
MARS - 71	245	68	16	329
SEC - 81	31	13	1	45
INT - 82	27	12	0	39
Other	80	156	42	278
TOTAL	3,561	1,230	179	4,970
MOC Group	CMC	Civ U	Unknown	TOTAL
All Ops	1,305	411	70	1,786
Naval MOCs	574	149	46	769
Combat Arms	450	143	22	615
Air Ops	610	200	32	842
Engineers	1,673	393	54	2,120
Non Mar Eng	1,344	312	24	1,680
Air Contl	38	23	2	63
SEC/INT	58	25	1	84
Minor	96	48	3	147
Support	407	222	10	639

ALL OFFICERS

Strength

12. The CF officer population grew by 25 percent in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in **Figure 1**, were:

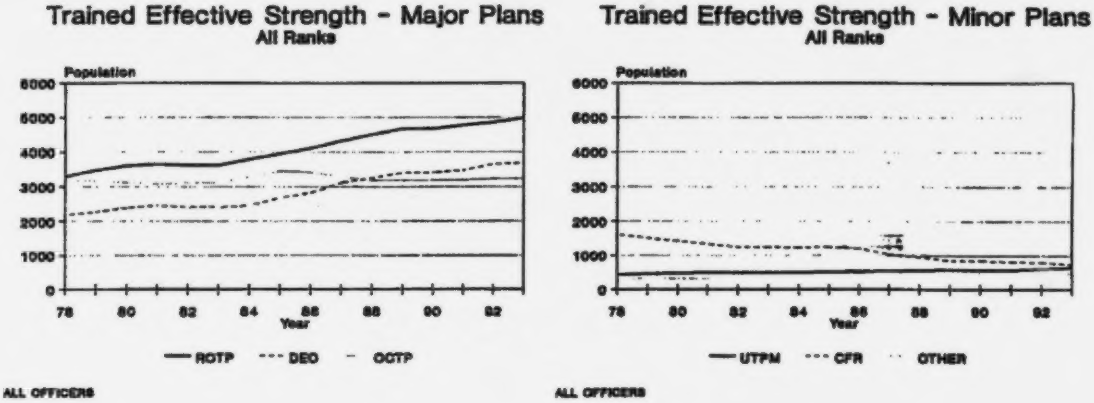

Figure 1: Trained Effective Strength
All Commissioning Plans - All Officers
Ranks - Lt to Col

a. ROTP - an increase of 51 percent over the period, most of the growth happening since 1983;

b. DEO - an increase of 69 percent, most of it having taken place since 1984;

c. OCTP - an overall increase of two percent, but with a minor decrease between 1985 and 1988 following growth from 1983 to 1985;

d. UTPM - an increase of 47 percent over the period;

e. CFR - a decrease of 55 percent, primarily in the periods from 1978 to 1982 and 1986 to 1989; and

f. other plans - an increase of 83 percent, largely between 1978 and 1982 (for all officers 'other plans' is predominantly specialist officer commissioning plans).

Commissioning Plan Distribution

13. Because there were changes in the composition of the total population, commissioning plan distributions in the period from 1978 to 1993 were also examined and showed:

a. for all officers:

(1) ROTP - a proportion of 30 percent in 1978 increased smoothly to 36 percent by 1993,

(2) DEO - a proportion of 20 percent in 1978 increased to 27 percent by 1993 in a similar fashion to ROTP,

(3) OCTP - a proportion of 29 percent in 1978 decreased, despite minor OCTP growth, to a proportion of 24 percent by 1993, and

(4) minor plans combined - a proportion of 21 percent in 1978 decreased to 13 percent by 1993;

b. for junior officers:

(1) ROTP - a proportion of 31 percent in 1978 increased to 33 percent by 1993, but fluctuated over the period between 33 percent and 29 percent,

(2) DEO - a proportion of 17 percent in 1978 increased to 29 percent by 1993,

(3) OCTP - a proportion of 28 percent in 1978 decreased to 25 percent by 1993, having been down to 25 percent and back to 28 percent in the interim, and

(4) minor plans combined - a proportion of 24 percent in 1978 decreased to 13 percent by 1993; and

c. for senior officers all changes in distributions occurred smoothly between 1978 and 1993:

(1) ROTP - a proportion of 28 percent increased to 42 percent,

(2) DEO - a proportion of 25 percent decreased to 22 percent,

(3) OCTP - a proportion of 30 percent decreased to 22 percent, and

(4) minor plans combined - a proportion of 16 percent in 1978 decreased to 14 percent by 1982, and remained there.

ROTP - CMC/Civilian University

14. ROTP numbers in general increased by 51 percent. Whereas the CMC component increased by 87 percent, civilian university ROTP graduates decreased by 10 percent (**Figure 2**). Between 1978 and 1993, CMC graduates went from representing 58 to 72 percent of all ROTP officers; civilian university ROTP graduates decreased their representation from 42 to 25[1] percent of ROTP officers. In other words, the increase in ROTP over the period was achieved through the CMC.

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[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

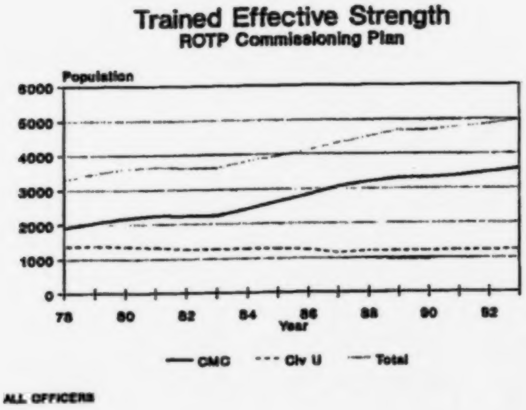

Figure 2: Trained Effective Strength
ROTP - All Officers
Ranks - Lt to Col

Eligibility Rates

15. **Major Plans** The ROTP eligibility rate at the Captain (Capt) rank has been relatively constant while the DEO and OCTP rates have been decreasing (**Figure** 3). On the other hand the DEO rate at the Major (Maj) rank has been relatively constant while the ROTP rate, consistently lower, decreased until 1988[2]. There was a similar trend at the Lieutenant Colonel (LCol) rank, although the DEO rate did drop between 1986 and 1990. Overall eligibility rates for OCTP officers have been consistently higher than those for either DEO or

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[2] Because 5-year moving averages are used to graph rates for eligibility (and for promotion); dates refer to the central year.

ROTP officers, while the ROTP eligibility rates have generally been the lowest. Eligibility rates for all plans have increased, since the 1990 forces reduction programme (FRP) resulted in a drop in the number of promotions.

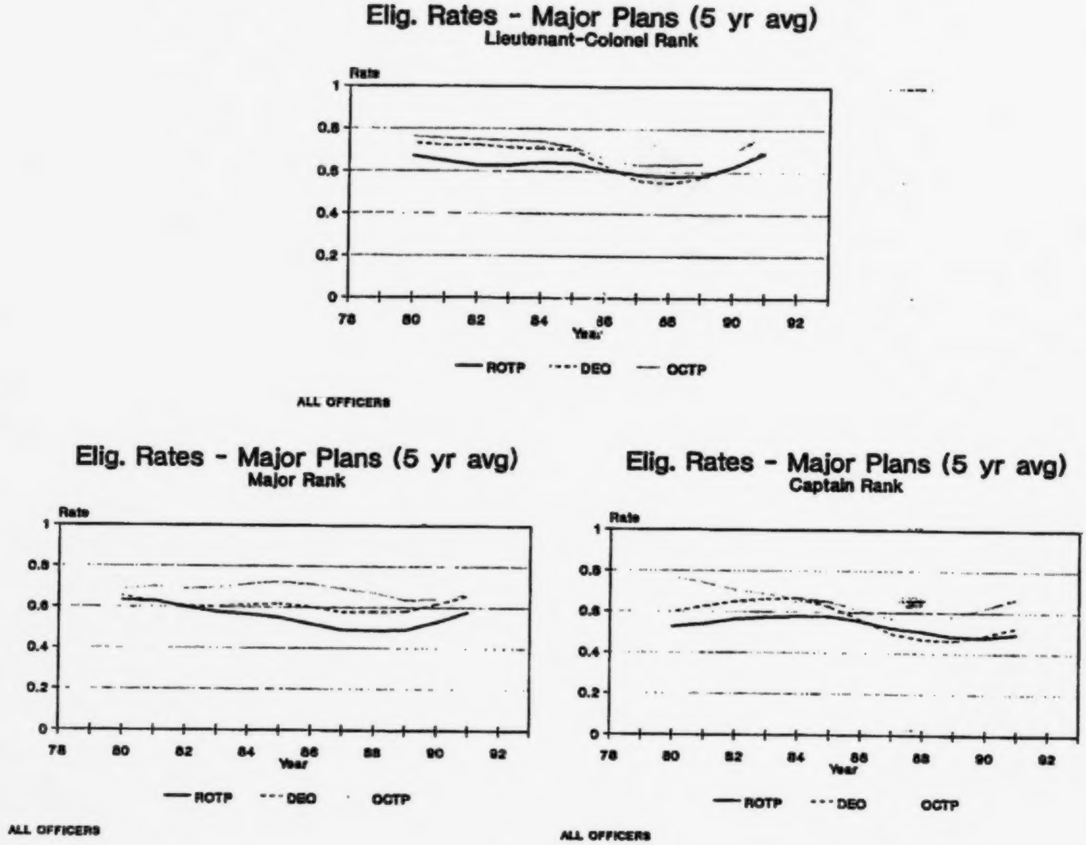

Figure 3: Eligibility Rates - Major Plans
5-year Moving Averages
All Officers

16. ROTP - CMC/Civilian University Eligibility rates for CMC graduates have been consistently lower at all three ranks (**Figure 4**). Eligibility rates for ROTP officers from both sources increased when the introduction of FRP resulted in a drop in the number of promotions.

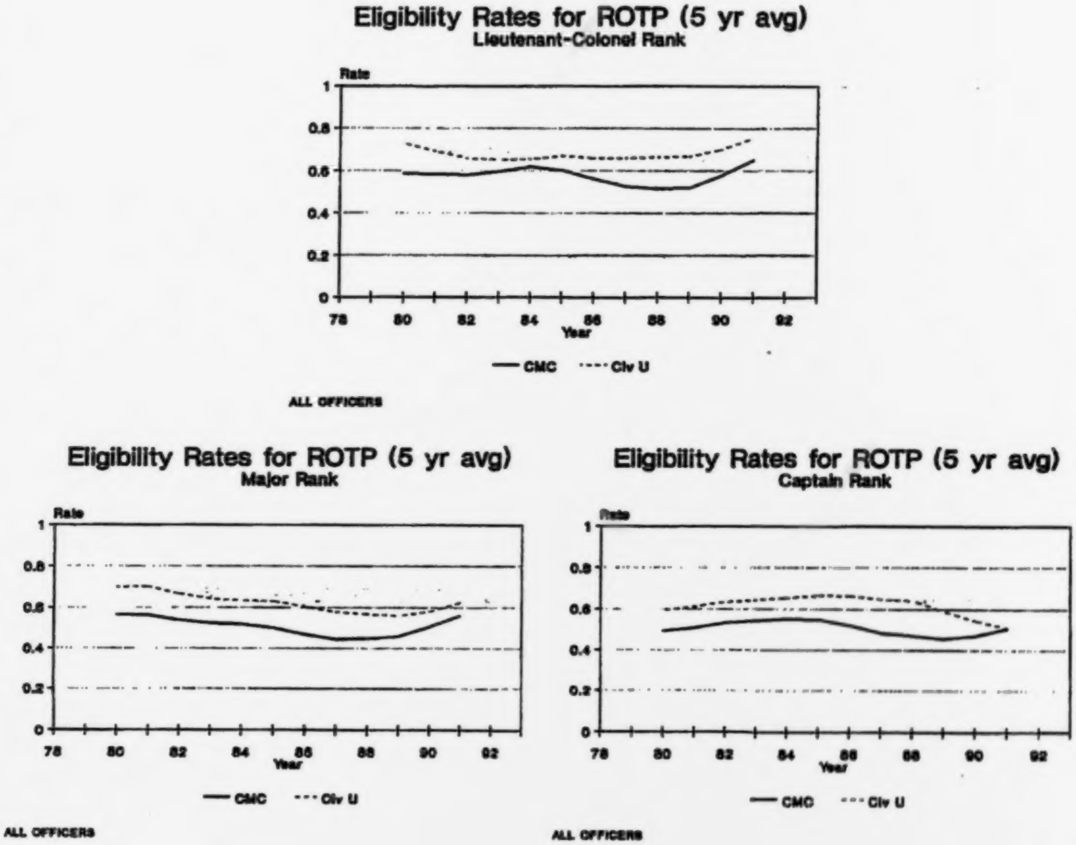

Figure 4: ROTP Eligibility Rates
5-year Moving Averages
All Officers

Promotion Rates

17. **Major Plans** When compared to DEO and OCTP, ROTP promotion rates have been significantly[3] higher at all rank levels (Figure 5). (Note that ROTP eligibility at each lower rank was consistently lower--promotions from a rank remove those eligible, while at the rank in question, those same promotions increase the non-eligible portion). The DEO rate of promotion to the Maj rank was significantly higher than the OCTP rate, but the rates of promotion to the two higher ranks have been similar. The reduction in the number of promotions due to the 1990 FRP is apparent as a drop in promotion rates for all rank levels.

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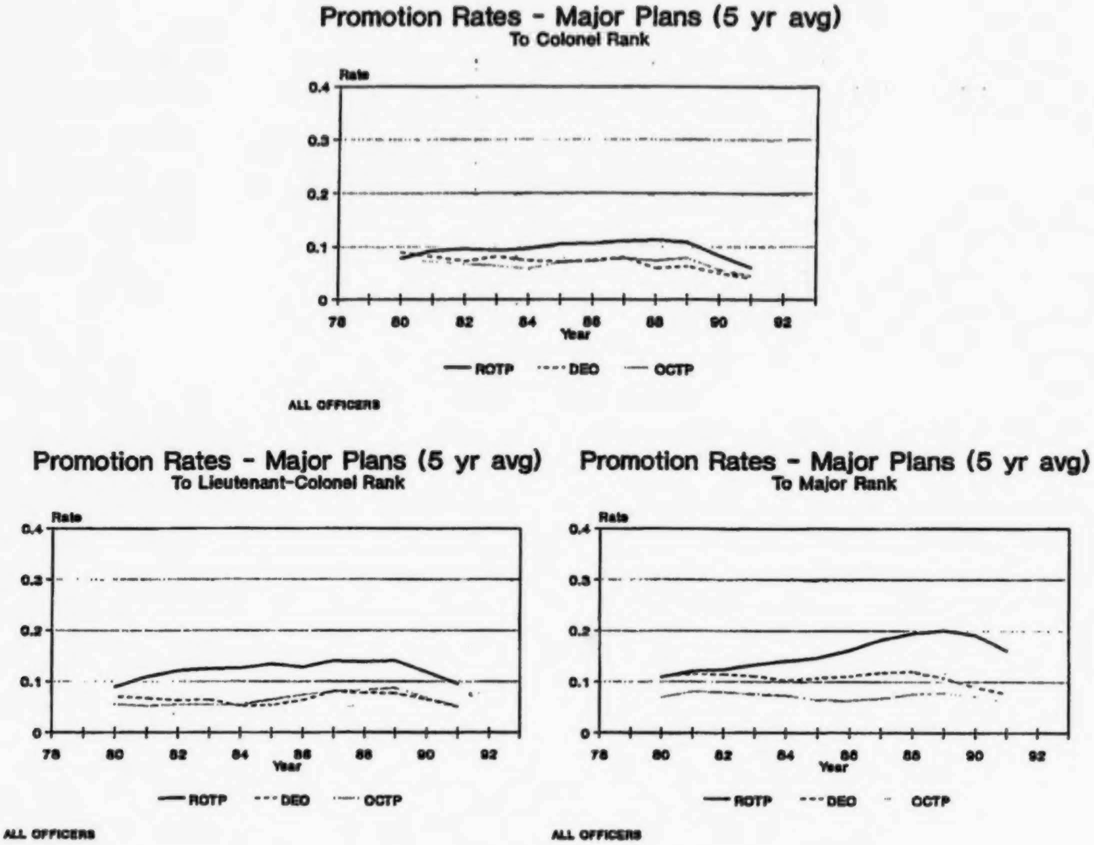
[3] All statements on significance were tested at the 95 percent confidence level.



Promotion Rates - Major Plans (5 yr avg)
To Colonel Rank

ALL OFFICERS

Promotion Rates - Major Plans (5 yr avg)
To Lieutenant-Colonel Rank

ALL OFFICERS

Promotion Rates - Major Plans (5 yr avg)
To Major Rank

ALL OFFICERS

Figure 5: Promotion Rates - Major Plans
5-year Moving Averages
All Officers

18. ROTP - CMC/Civilian University The CMC rates of promotion to all senior ranks examined were generally higher, however statistical tests on the differences were inconclusive (Figure 6). The effects of the FRP are apparent at all ranks as a decline in promotion rates.

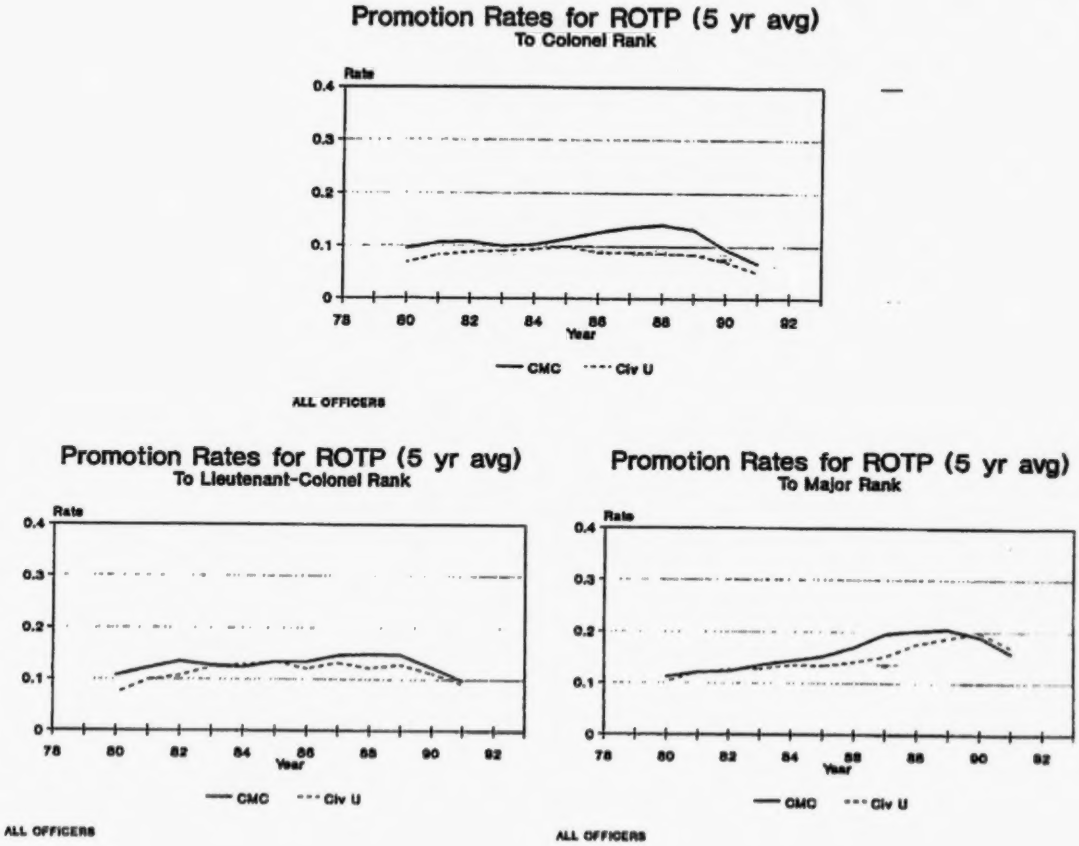


Figure 6: ROTP Promotion Rates
5-year Moving Averages
All Officers

Retention

19. **Minor Plans** The retention curves (Figure 7) reveal that the average length of service was 13.5 years of commissioned service (YCS) (23.8 years of service (YOS)) for UTPM officers, 10.8 YCS (27.2 YOS) for CFR officers, and 4.7 YCS (23.0 YOS)[4] for officers commissioned under other plans.

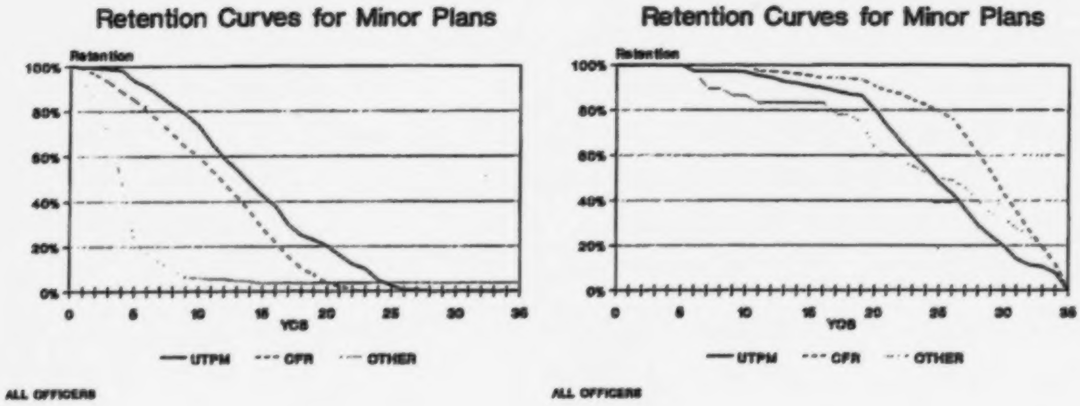


Figure 7: Minor Plan Retention Curves
All Officers

20. **Major Plans** In the YCS plot (Figure 8) ROTP attrition increased following three years of obligatory service, and retention levelled off near 62 percent at the

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[4] The difference between the YCS and YOS graphs is because these officers have considerable service prior to commissioning.

start of the intermediate engagement (IE)[5]. ROTP/DEO differences in retention were significant until seven YCS, while ROTP/OCTP and DEO/OCTP differences were significant across the YCS plot. On the YOS curves all three plans showed an increase in attrition at the start of the IPS. DEO attrition was the greatest, and both ROTP/DEO and OCTP/DEO differences in retention were significant. The average length of service was 16.0 YCS (19.7 YOS) for ROTP officers, 15.8 YCS (17.2 YOS) for DEO officers, and 18.0 YCS (19.5 YOS) for OCTP officers.

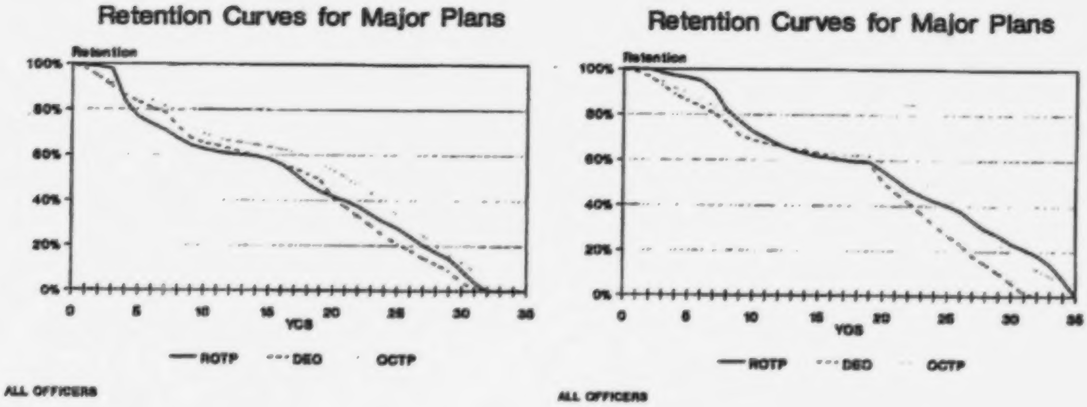

**Figure 8: Major Plan Retention Curves
All Officers**

21. ROTP - CMC/Civilian University The YCS retention curves for ROTP officers are extremely similar during the

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[5] Since the officer career development plan (OCDP) was introduced, officers have been initially commissioned for a short engagement (SE), a period that goes to nine YCS. Those officers that accept an offer of an IE then may serve until completing 20 YOS, and those that subsequently accept an offer of an indefinite period of service (IPS) continue to serve beyond 20 YOS until age 55.

first five years (**Figure 9**). CMC attrition started to level earlier but attrition for officers from a civilian university background continued at a slightly higher rate until nine YCS. The YOS curves indicate that civilian university officers entered their post-obligatory attrition earlier than CMC officers, with significant differences in retention until 12 YOS. About 62 percent of CMC and 57 percent of civilian university officers remained through the IE; differences in retention being significant from 15 to 17 YOS. Both plans had similar attrition characteristics from the start of the IPS until 26 YOS. Officers from civilian universities had a significantly greater propensity to leave at 28 YOS. The average length of service was 16.2 YCS (20.5 YOS) for ROTP officers from CMC and 15.8 YCS (18.9 YOS) for ROTP officers from civilian universities.

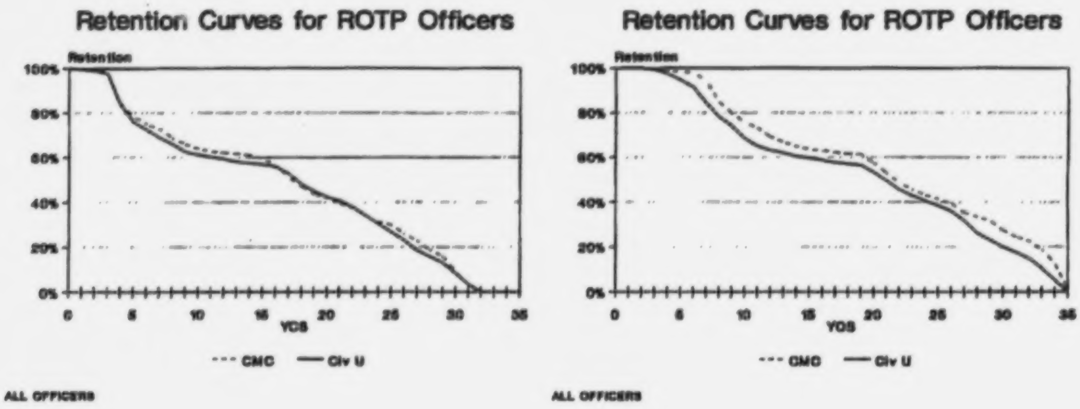

**Figure 9: ROTP Retention Curves
All Officers**

22. Civilian University - ROTP/DEOD Of those that attended civilian universities, DEOD officers experienced fairly consistent attrition until 20 YCS (YOS), whereas

attrition for ROTP officers started following three years of obligatory service and was high until five YCS. Neither curve showed any response to the nine YCS gratuity offered at the end of the short engagement (SE) (**Figure 10**). DEOD retention was near 60 percent at the 20 YOS-point, while ROTP retention was near 57 percent. During the IPS DEOD retention was significantly lower than for ROTP officers. The average length of service was 15.8 YCS (18.9 YOS) for ROTP officers from civilian universities and 16.5 YCS (17.2 YOS) for DEOD officers.

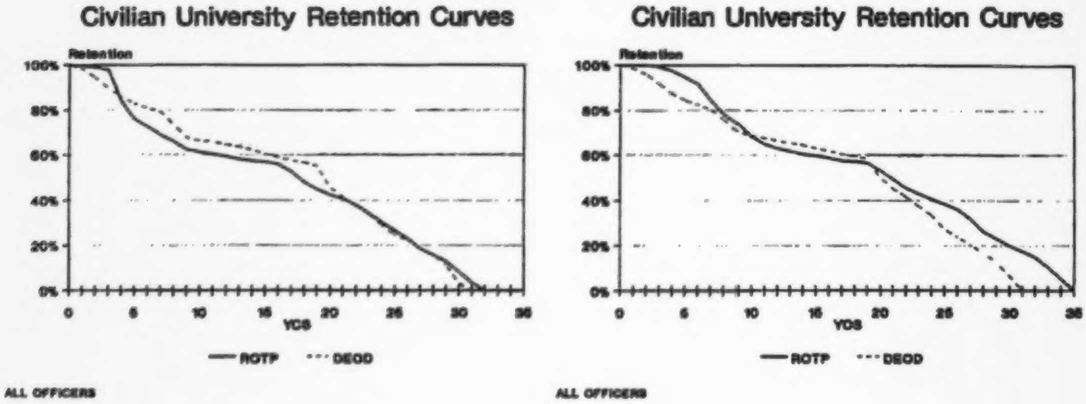

Figure 10: Civilian University Retention Curves All Officers

PART III - DISCUSSION

RECRUITMENT

23. The only source of CF personnel is from amongst those that have been drawn into recruitment centres across the country. Active recruitment is conducted through the media; through briefing sessions offered in high schools, colleges and universities; and through displays set up at major attractions. Recruits are subjected to basic training, followed by specific trade and occupational training, before employment at any level within the CF. In other words, basic recruitment simply gets people into the CF, how or where they are employed is another process.

24. Leaders, managers and executives of the CF are designated as officers, and are acquired through selective recruitment. The selection of officer candidates for service in the CF is a complex process that is complicated by the front-end loaded[6] nature of the CF personnel system.

25. The recruitment process must consider the potential of the individual as well as his current qualifications to fulfil the needs of the CF. To accomplish this the CF recruits officers from a variety of sources which include:

a. educated candidates through DEO;

b. experienced military NCM personnel through OCTPM, UTPM, CFR and LDO; and

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[6] The front-end loaded system is one that recruits the uninitiated, trains them, passes training graduates into the bottom of the hierarchy, and then promotes from within to fill vacancies at higher levels. The CF hierarchy is defined by military rank.

c. candidates showing leadership potential and desirous of higher education through OCTP, ROTP and RETP.

26. This paper is focused on officers that have been assigned to an MOC, who have completed initial occupational training and who have been (or are) employed in one of the MOCs under study. An officer's commissioning plan is indicative of which qualifications were possessed by an individual when recruited.

CAREER PROGRESSION ANALYSIS

Strength

27. As summarized in **Table 5**, the growth in trained effective strength is apparent in all individual MOCs and MOC groups except for air operations (air ops). When CF growth is examined by commissioning plan, it is evident that the strength of ROTP and DEO officers has increased everywhere, even in air ops, while CFR strength has decreased. The observed increase in strength has been larger for DEO than for ROTP in most of the MOC groups and individual MOCs; the exceptions being a larger increase in ROTP strength in the minor MOCs combined and in the individual INF, ANAV, AERE and CELE MOCs. For the 'other' plans global increases in the number of officers are apparent; the fact that increases are disproportionately large reflects that the 'other' plans have not been overly utilized in the past.

Table 5: Trained Effective Strength
Percentage Change from 1978 to 1993

PLANS	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
ROTP	↑ 51	↑ 31	↑ 92	↑ 36	↑ 25	↑ 70	↑ 55	↑ 40	↑ 107
DEO	↑ 69	↑ 49	↑ 168	↑ 51	↑ 34	↑ 109	↑ 76	↑ 183	↑ 93
OCTP	↑ 2	↑ 5	↑ 74	↑ 34	↓ 20	↓ 48	↓ 43	↓ 43	↑ 94
UTPM	↑ 47	→ 0	↑ 44	↑ 400	↓ 31	↑ 40	↑ 27	↑ 48	↑ 145
CFR	↓ 55	↓ 52	↓ 75	↓ 30	↓ 88	↓ 59	↓ 54	↓ 12	↓ 68
OTHER	↑ 83	↑ ∞	↑ ∞	↑ ∞	↑ ∞	↑ ∞	↑ ∞	↑ ∞	↑ ∞
TOTAL	↑ 25	↑ 18	↑ 62	↑ 36	→ 0.1	↑ 34	↑ 26	↑ 41	↑ 43

	INF MOC23	ANAV MOC31	PLT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
ROTP	↑ 47	↑ 35	↑ 21	↑ 87	↑ 53	↑ 58	↑ 167	↑ 20	↑ 23	↑ 40
DEO	↑ 31	→ 3	↑ 46	↑ 32	↑ 20	↑ 103	↑ 300	↑ 83	↑ 134	↑ 98
OCTP	↑ 23	↓ 29	↓ 16	↓ 45	↓ 51	↓ 10	↓ 71	↑ 50	↓ 51	↑ 89
UTPM	↑ 900	↓ 29	↓ 33	↑ 30	↑ 17	↑ 180	↑ 188	↑ 19	↑ 29	↓ 48
CFR	↓ 38	↓ 86	↓ 100	↓ 52	↓ 58	↓ 55	↓ 78	↓ 92	↓ 38	↓ 69
OTHER	↑ ∞	↑ ∞	↑ 200	↑ ∞	↑ ∞	↑ ∞	↑ ∞	↑ ∞	↑ ∞	↑ ∞
TOTAL	↑ 29	↓ 10	↑ 5	↑ 34	↑ 16	↑ 44	↑ 76	↑ 19	↑ 18	↑ 54

∞ - represents an increase from zero in 1978.

Table 6: ROTP - Trained Effective Strength Percentage Change from 1978 to 1993

	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
CMC	↑ 87	↑ 58	↑ 128	↑ 62	↑ 52	↑ 116	↑ 101	↑ 73	↑ 182
CIV U	↓ 10	↓ 20	↑ 11	↓ 15	↓ 26	↓ 17	↓ 24	↑ 1	↑ 30
ROTP	↑ 51	↑ 31	↑ 92	↑ 36	↑ 25	↑ 70	↑ 55	↑ 40	↑ 107

	INF MOC23	ANAV MOC31	PLT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
CMC	↑ 85	↑ 58	↑ 49	↑ 150	↑ 91	↑ 107	↑ 210	↑ 54	↑ 50	↑ 68
CIV U	↓ 17	↓ 9	↓ 33	↓ 24	↓ 10	↓ 24	↑ 40	↓ 46	↓ 10	↓ 13
ROTP	↑ 47	↑ 35	↑ 21	↑ 87	↑ 53	↑ 58	↑ 167	↑ 20	↑ 23	↑ 40

28. When the trained effective strength of ROTP officers is analyzed according to university type, as illustrated in **Table 6**, substantial growth in the use of CMC is apparent throughout. On the other hand, the use of ROTP at civilian universities has grown only for the naval and minor MOC groups, and within the naval group the growth has been specifically for MARE officers. In these two MOC groups, however, the growth in the number of ROTP officers from the CMC has been even more substantial than that seen for ROTP officers from civilian universities.

Commissioning Plan Distribution

29. Having identified changes in trained effective strength, the representation of ROTP and DEO officers has increased as expected, generally at the expense of officers from OCTP and the minor plans. As exceptions the commissioning plan distribution in the naval and minor MOC groups (**Table 7**) and in the MARS MOC (**Table 8**) show increased OCTP representation.

30. DEO representation has increased within the junior ranks for all MOCs and MOC groups in which the strength increased. DEO junior rank (Capt and below) representation remains unchanged only for the unique MOC that decreased in strength (ANAV). OCTP representation within the junior ranks has increased only in the naval and minor MOC groups, and in the MARS and MILE MOCs. Changes in ROTP representation have been variable within the junior ranks.

31. Within the senior ranks (Maj and above) the proportion of ROTP officers has increased throughout. For MOC groups, DEO representation is unchanged in air ops and has increased only in the naval group. DEO officer representation has varied considerably across the individual MOCs. OCTP representation in the senior ranks has increased only in the minor MOC group, and in the MARS and INF MOCs.

Table 7: Population Proportions
Proportional Change from 1978 to 1993

PLANS	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
ALL OFFICERS									
ROTP	↑30-36	↑28-31	↑36-43	↑31-32	↑25-31	↑46-59	↑48-59	↓34-33	↑11-16
DEO	↑20-27	↑17-22	↑15-25	↑17-19	↑17-23	↑14-22	↑15-20	↑18-36	↑18-24
OCTP	↓29-24	↓50-44	↑23-25	→45-45	↓56-45	↓5-2	↓5-2	↓24-10	↑32-43
MINOR	↓21-13	↓5-3	↓26-7	↓7-5	↓2-1	↓35-17	↓33-19	↓24-21	↓39-17
JUNIOR OFFICERS									
ROTP	↑31-33	↓29-27	↑38-42	↓30-29	↓27-26	↑45-57	↑46-56	↓39-28	↑12-14
DEO	↑17-29	↑15-23	↑15-25	↑13-19	↑17-26	↑12-24	↑13-23	↑13-44	↑16-26
OCTP	↓28-25	↓50-47	↑23-27	→47-47	↓54-47	↓3-1	↓3-1	↓20-7	↑31-45
MINOR	↓24-13	↓6-3	↓26-7	↓10-6	↓2-1	↓40-18	↓39-20	↓28-21	↓41-15
SENIOR OFFICERS									
ROTP	↑28-42	↑26-39	↑34-44	↑31-36	↑22-42	↑48-62	↑51-63	↑22-44	↑9-20
DEO	↓25-22	↓21-19	↑18-26	↓25-18	→18-18	↓20-19	↓18-16	↓28-21	↓22-20
OCTP	↓30-22	↓49-19	↓23-22	→42-42	↓59-39	↓4-3	↓8-3	↓33-15	↑32-38
MINOR	↓16-14	→3-3	↓25-9	↑1-4	→1-1	↓27-17	↓24-17	↑17-20	↓37-22

Table 8: MOC Population Proportions
Proportional Change from 1978 to 1993

PLANS	INF MOC23	ANAV MOC31	PLT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
ALL OFFICERS										
ROTP	↑28-32	↑25-37	↑25-29	↑48-66	↑39-52	↑52-57	↑38-58	→59-59	↑33-35	↓35-31
DEO	→17-17	↑15-18	↑18-25	→12-12	↑13-21	↑20-28	↑12-29	↑17-27	↑18-35	↑18-23
OCTP	↓48-46	↓57-44	↓56-45	↓ 2-1	↓10-4	↓ 3-2	↓ 6-1	→ 1-1	↓24-10	↑34-42
MINOR	↓ 7-5	↓ 3-1	→ 1-1	↓39-21	↓37-23	↓25-13	↓45-12	↓23-13	↓25-20	↓13-4
JUNIOR OFFICERS										
ROTP	↑27-31	↑25-32	↓27-24	↑48-63	↑38-52	↑48-52	↑41-60	↓54-52	↓39-29	↓36-28
DEO	↑11-17	→17-17	↑17-29	↑9-13	↑11-24	↑19-31	↑9-29	↑18-33	↑13-44	↑15-21
OCTP	↓51-46	↓54-50	↓55-46	→ 1-1	↓ 7-2	→ 2-2	↓ 1-0	↑ 0-1	↓20-7	↑36-48
MINOR	↓11-6	↓ 4-1	→ 1-1	↓42-23	↓44-22	↓31-15	↓50-11	↓28-13	↓28-20	↓13-3
SENIOR OFFICERS										
ROTP	↑29-33	↑24-47	↑21-40	↑47-74	↑41-51	↑58-64	↑35-55	↑66-69	↑22-47	↑33-36
DEO	↓25-17	↑12-19	↓21-17	↓17-8	↑17-18	↑22-24	↑15-29	↑16-18	↓28-20	↑21-25
OCTP	↑44-46	↓63-31	↓57-42	↓ 3-0	↓16-7	↓ 6-2	↓11-2	↓ 2-1	↓33-15	↑31-34
MINOR	↑ 1-4	↑ 1-3	→ 1-1	↓33-17	↓25-24	↓14-10	↓39-15	↓16-12	↑17-18	↓15-5

32. Since there has been considerable growth in the strength of those ROTP officers that come from CMC, it is not surprising that the representation of these officers has also increased (Table 9). The CMC/civilian university split, about 60/40 in 1978 for all operational MOCs and MOC groups, shifted to 75/25 by 1993; for engineering officers the split went from 60/40 to about 80/20; and for the support and minor MOCs and MOC groups the split generally went from about 50/50 to 65/35.

Table 9: ROTP - Proportions in 1978 and 1993 CMC/Civilian Universities[7]

	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
1978	58/42	61/38	63/34	62/37	60/40	62/38	62/38	51/48	48/52
1993	72/25	73/23	75/19	73/23	72/24	79/19	80/19	64/35	65/33

	INF MOC23	ANAV MOC31	PLT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
1978	60/36	58/42	60/39	61/39	61/39	61/39	64/35	64/36	51/48	62/26
1993	75/20	68/28	74/22	82/16	75/23	80/20	75/18	83/16	63/35	74/21

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[7] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

Eligibility Rates

33. In an analysis of career progression the automatic tendency of comparing the number promoted to the rank population from which they were elevated is improper. A promoted individual can only come from the eligible sub-set of a rank population, not the whole population[8]. The eligibility rates for the individual MOCs and the MOC groups have therefore been examined and are summarized in the following tables. No statistical tests were conducted, but tabulated comments incorporate reasoned judgement on the data available. Where data was lacking or where differences were not obvious, little was said.

34. In examining the eligibility rate at any rank, it must be remembered that a high rate of promotion into or out of that rank will keep the eligibility rate low. Promotions remove those officers eligible from the lower rank while at the higher rank, promotions add to the non-eligible portion.

35. In **Table 10** which summarizes the eligibility rates for MOC groups it is apparent that the general eligibility of ROTP and DEO officers is lower than that for OCTP officers. When DEO and ROTP officer eligibility is compared, differences are less obvious, but ROTP eligibility is frequently lower. Within ROTP, CMC eligibility is predominantly lower than that for ROTP officers from civilian universities.

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[8] Eligibility for promotion in this study is based solely on a minimum time in rank criterion varying with rank. Details of this methodology are found in Annex A.

Table 10: Comparison of Group Eligibility Rates

At Rank	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
ROTP compared with DEO									
LCol	Lower	Lower	Lower	~	Alike	~	Lower	Lower	~
Maj	Lower	Lower	~	Alike	Lower	~	~	Lower	Lower
Capt	Lower	~	Lower	Lower	~	~	~	~	~
ROTP compared with OCTP									
LCol	Lower	Lower	Lower	Alike	Lower	Lower	Lower	Lower	~
Maj	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower
Capt	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	~
DEO compared with OCTP									
LCol	Lower	Lower	Lower	~	Lower	Lower	Lower	~	~
Maj	Lower	Lower	~	Lower	Lower	Lower	Lower	Lower	Lower
Capt	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	~
ROTP/CMC compared with ROTP/Civilian Universities									
LCol	Lower	Lower	Lower	Lower	Lower	Lower	Lower	~	Higher
Maj	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower
Capt	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower

~ - represents no consistency in trends

36. In an examination of **Table 11**, it is apparent that generalized comments on eligibility rates for individual MOCs are more difficult to make as many of the MOCs either do not have sufficient numbers for calculations or do not have concrete trends. AERE is the only MOC where ROTP eligibility rates are lower than those for DEO at all three ranks; ANAV and LOG are the only MOCs where ROTP rates are also consistently lower than those for OCTP. In a comparison of DEO and OCTP eligibility rates, only the ANAV MOC shows a consistent trend with the DEO rates being lower. CMC eligibility rates are generally lower than those for civilian universities - the exception being the MARE MOC. In this MOC, the CMC eligibility rate is lower only at the Cdr rank.

Table 11: Comparison of MOC Eligibility Rates

At Rank	INF MOC23	ANAV MOC31	PLT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
ROTP compared with DEO										
LCol	~	~	Alike	Lower	Lacks DEO	Lacks number of DEO and OCTP	Lacks DEO	Lacks DEO	Lower	Lower
Maj	Alike	~	Lower	Lower	Lower		~	~	Lower	~
Capt	Lower	~	~	Lower	~		Lower	~	~	Alike
ROTP compared with OCTP										
LCol	Alike	Lower	Lower	Lacks number of OCTP	Lacks OCTP	Lacks number of DEO and OCTP	Lacks number of OCTP	Lacks number of OCTP	Lower	Lower
Maj	Lower	Lower	Lower		Lower				Lower	Alike
Capt	Lower	Lower	~		Lower				Lower	Alike
DEO compared with OCTP										
LCol	~	Lower	Lower	Lacks number of OCTP	Lacks OCTP	Lacks number of DEO and OCTP	Lacks number of OCTP	Lacks number of OCTP	~	Alike
Maj	Lower	Lower	Alike		Lower				Lower	~
Capt	Alike	Lower	Lower		Lower				Lower	Alike
ROTP/CMC compared with ROTP/Civilian Universities										
LCol	Lower	Lower	Lower	Lower	Alike	Lower	Lower	Lower	~	~
Maj	Lower	Lower	Lower	Lower	Lower	Lower	~	Lower	Lower	Lower
Capt	Lower	Lower	Lower	Lower	Lower	Lower	Alike	~	Lower	Lower

~ - represents no consistency in trends

Promotion Rates

37. **ROTP compared with DEO** In the analysis of promotion rates in the MOC groups (**Table 12**), ROTP rates have been generally higher, and for promotions to the ranks below Col these differences have been generally significant[9]. In the analysis of promotion rates in the individual MOCs (**Table 13**), trends are less visible. Where numbers are sufficient for analysis, ROTP rates are generally higher but only significantly so in a few MOCs: in the PLT MOC for promotion to Maj and LCol, in the CELE and MARE MOCs for promotion to LCol and in the LOG MOC for promotion to Maj.

38. **ROTP compared with OCTP** ROTP promotion rates have generally been significantly higher than those for OCTP in all of the MOC groups. Where the number of OCTP officers is sufficient for study in the individual MOCs, ROTP promotion rates have also been consistently higher and significantly so in most cases.

39. **DEO compared with OCTP** DEO promotion rates to the Maj rank have been higher in all of the MOC groups except the support MOC group, and generally the differences have been significant. On the other hand, promotion rates to the LCol rank in the MOC groups have been similar. Promotion rates to the Col rank favoured DEO officers in combat arms and significantly so in the minor MOCs, but favoured OCTP officers in the non-maritime engineering and support MOC groups. DEO promotion rates to the Maj rank have also been higher in the individual INF, PLT, CELE and MARS MOCs, and have been significantly higher in the ANAV MOC. Where there have been

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[9] The term "significant" used throughout the analysis pertains to the results of statistical tests conducted at the 95% confidence level.

sufficient data for analysis of promotion rates to the LCol and Col ranks, statistical tests do not support any evidence of significant differences. The DEO promotion rate to Col in the INF MOC has been higher while it has been lower in the LOG MOC.

40. CMC compared with Civilian Universities When comparing the promotion rates for the MOC groups, the CMC rates of promotion to the Col rank have been generally higher but only significantly so in air ops. The CMC and civilian university rates to the Maj and LCol ranks have been generally similar in the MOC groups. Similar trends are seen in the individual MOCs. The CMC rates have actually been lower at the Maj rank in the ANAV, MILE and MARS MOCs and at the LCol rank in the MARS MOC.

Table 12: Comparison of Group Promotion Rates

To Rank	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
ROTP compared with DEO									
Col	**Higher**	Higher	Higher	~	**Higher**	Higher	Higher	Higher	Small #s
LCol	**Higher**	**Higher**	**Higher**	Higher	**Higher**	**Higher**	**Higher**	Higher	Higher
Maj	**Higher**	**Higher**	Higher	**Higher**	**Higher**	**Sig** ~	~	**Higher**	Higher
ROTP compared with OCTP									
Col	**Higher**	**Higher**	Higher	Higher	**Higher**	Higher	Alike	Higher	**Higher**
LCol	**Higher**	**Higher**	**Higher**	**Higher**	**Higher**	Higher	Higher	Higher	Higher
Maj	**Higher**	**Higher**	**Higher**	**Higher**	**Higher**	**Higher**	Higher	**Higher**	**Higher**
DEO compared with OCTP									
Col	Alike	Alike	Alike	Higher	Alike	~	Lower	Lower	**Higher**
LCol	Alike	Alike	Alike	Alike	Alike	Alike	Alike	Alike	Alike
Maj	**Higher**	**Higher**	**Higher**	Higher	**Higher**	Higher	Higher	Alike	Higher
ROTP/CMC compared with ROTP/Civilian Universities									
Col	Higher	Higher	~	Higher	**Higher**	Alike	Alike	Higher	Small #s
LCol	Alike	Alike	~	Alike	~	Alike	Alike	Alike	Higher
Maj	Alike	Alike	~	Higher	~	Alike	Alike	Alike	Higher

Bold (or **Sig**) - Statistically Significant ~ - alternating high/low
Small #s - refers to comparisons where there are insufficient data for analysis

Table 13: Comparison of MOC Promotion Rates

To Rank	INF MOC23	ANAV MOC31	PLT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
ROTP compared with DEO										
Col	Lower	Small #s	Higher	Alike	Small #s	Small #s	Small #s	Small #s	Higher	Higher
LCol	Higher		**Higher**	Higher	**Higher**		**Higher**	Alike	Higher	Higher
Maj	Higher		**Higher**	Alike	Higher		Alike	Higher	**Higher**	~
ROTP compared with OCTP										
Col	Alike	Higher	**Higher**	Small #s	Small #s	Small #s	Small #s	Small #s	Higher	Higher
LCol	**Higher**	**Higher**	**Higher**		Higher				**Higher**	Higher
Maj	**Higher**	**Higher**	**Higher**		Higher				~	**Higher**
DEO compared with OCTP										
Col	Higher	Small #s	Alike	Small #s	Small #s	Small #s	Small #s	Small #s	Lower	~
LCol	Alike		Alike		Alike				Alike	Alike
Maj	Higher	**Higher**	Higher		Higher				**Sig ~**	Higher
ROTP/CMC compared with ROTP/Civilian Universities										
Col	Alike	Higher	Higher	Alike	Alike	Higher	Small #s	Higher	Higher	Alike
LCol	Higher	Higher	Alike	Alike	Higher	Alike		Alike	Alike	Lower
Maj	~	Lower	Alike	Alike	Alike	Higher		Lower	Alike	Lower

Bold (or **Sig**) - Statistically Significant ~ - alternating high/low
Small #s - refers to comparisons where there are insufficient data for analysis

OFFICER RETENTION ANALYSIS

General

41. Contractual terms of service are generally defined relative to YCS or to YOS, so the retention profiles presented in this study depict survival probabilities within MOC groups and individual MOCs as a function of experience measured both ways. Conversion to an IE after the SE is specified in terms of YCS, so YCS curves were produced primarily to examine early retention/attrition. The conversion to an IPS at the end of the IE is specified in terms of YOS, so YOS curves were produced to examine service beyond ten YCS (or after 13-15 YOS).

42. Recent studies[10] have shown that attrition rate patterns related to CF terms of service have developed over time. There are low periods of attrition during the initial and mid-life stages of a member's career due to periods of obligation and 'pension lock-in'. In those occupations where professional demand is high outside the CF, attrition rates increase sharply after obligatory service, and rates increase again around nine YCS. Officers that accept an IE generally serve until entitled to a pension at 20 YOS which results in a period of low attrition from 14 to 20 YOS. The attrition rate then increases beyond 20 YOS as a result of IPS conversion policies combined with the fact that some seek other careers with the financial security of a CF pension. The attrition rate continues to increase slightly thereafter, influenced additionally by such issues as: no pension penalties after 28 YOS, full pension after 35 YOS, and compulsory retirement age (CRA).

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[10] References 3, 4 and 5.

43. Because attrition rates follow patterns related to periods of service, statistical testing was conducted on data grouped into three periods of service:

a. from zero to 10 years;
b. from 11 to 20 years; and
c. beyond 20 years.

Identical testing was conducted on that service measured in both YCS and YOS.

Comparison of Retention Patterns

44. **ROTP compared with DEO** In the comparison of ROTP and DEO retention by YCS (**Tables 14 and 16**), the influence of obligatory service for ROTP officers results in significant differences in retention patterns in the first 10 YCS. Retention is better for ROTP officers in the first few years but following the period of obligatory service (5 to 10 YCS) DEO retention is better. Comparative analysis by YOS (**Tables 15 and 17**) shows that after 20 YOS ROTP retention is better.

45. **ROTP compared with OCTP** The influence of obligatory service for ROTP officers can also be seen in the comparison of retention for ROTP and OCTP officers. In most cases the differences are once again significant although there were insufficient numbers of OCTP officers in the engineering MOCs for analysis. Retention beyond 10 YOS is better for OCTP officers with the exception of air ops and all operational MOCs combined.

46. **DEO compared with OCTP** There are few significant differences in YCS retention patterns for DEO and OCTP officers in the first 10 YCS. On the other hand OCTP

retention beyond 10 YOS is significantly better than DEO retention across the MOC groups. There were insufficient numbers to comment on for individual MOCs.

47. ROTP/CMC compared with ROTP/Civilian Universities Retention for ROTP officers from CMC is generally better in the first 10 YCS than retention for ROTP officers from civilian universities, however the statistical tests do not indicate significant differences. Retention for ROTP officers from CMC is also better beyond 10 YOS, significantly so only in air ops MOCs.

48. ROTP/Civilian Universities compared with DEOD The influence of obligatory service for ROTP officers from civilian universities can also be seen in the comparison of retention for ROTP and DEOD officers. The statistical tests do not show any significant differences. Retention in the period from 10 to 20 YOS is better for DEOD officers except for the PLT MOC where retention is significantly better for ROTP officers. Beyond 20 YOS where numbers were sufficient for analysis ROTP officers have better retention.

Table 14: Comparison of Group Retention by YCS

YCS	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
ROTP compared with DEO (R or D is better)									
1st 10	Sig ~	~	Sig ~	Sig ~	Sig ~	~	Sig ~	Sig ~	~
2nd 10	D	Sig R	D	D	Sig R	D	Sig D	D	~
21→	Sig R	Sig R	~	~	Sig R	Alike	Alike	N/A	N/A
ROTP compared with OCTP (R or O is better)									
1st 10	Sig O	Sig ~	Sig ~	Sig ~	Sig ~	N/A	N/A	~	Sig ~
2nd 10	Sig O	~	Sig O	Sig O	R	Sig O	Sig O	~	O
21→	Sig O	~	Sig O	O	R	Sig O	Sig O	N/A	N/A
DEO compared with OCTP (D or O is better)									
1st 10	Sig O	D	O	Alike	Alike	N/A	N/A	D	O
2nd 10	Sig O	Sig O	O	D	Sig O	Sig O	Sig O	D	Sig O
21→	Sig O	Sig O	O	O	Sig O	Sig O	Sig O	O	N/A
ROTP/CMC compared with ROTP/Civilian Universities (M or U is better)									
1st 10	M	M	Alike	U	Sig M	M	Sig M	U	N/A
2nd 10	~	M	~	U	Sig M	~	~	U	N/A
21→	~	M	N/A	~	~	Alike	Alike	N/A	N/A
ROTP/Civilian Universities compared with DEOD (U or D is better)									
1st 10	Sig ~	~	~	~	Sig ~	~	~	Sig ~	~
2nd 10	D	D	D	D	Sig D	Alike	D	D	D
21→	U	U	N/A	N/A	N/A	~	U	N/A	N/A

Sig - Significant Differences ~ - alternating **N/A** - Insufficient Data

Table 15: Comparison of Group Retention by YOS

YOS	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
ROTP compared with DEO (**R** or D is better)									
1st 10	Sig R	Sig R	R	Sig R	Sig R	Sig R	Sig R	R	R
2nd 10	~	R	D	D	Sig R	~	D	Alike	~
21→	Sig R	Sig R	~	~	Sig R	R	R	R	N/A
ROTP compared with OCTP (**R** or **O** is better)									
1st 10	R	Sig R	Sig R	Sig R	Sig R	N/A	N/A	R	~
2nd 10	O	R	O	O	Sig R	Sig O	Sig O	R	O
21→	Sig ~	Sig R	Sig O	~	Sig R	Sig O	Sig O	Alike	N/A
DEO compared with OCTP (D or **O** is better)									
1st 10	Sig O	~	O	Alike	~	N/A	N/A	D	O
2nd 10	O	~	O	D	O	Sig O	Sig O	D	O
21→	Sig O	Sig O	N/A	Sig O	Sig O	Sig O	Sig O	O	N/A
ROTP/CMC compared with ROTP/Civilian Universities (**M** or **U** is better)									
1st 10	Sig M	Sig M	~	M	Sig M	Sig M	Sig M	M	M
2nd 10	Sig M	Sig M	M	Alike	Sig M	M	M	Alike	N/A
21→	M	M	N/A	~	Sig M	M	M	~	N/A
ROTP/Civilian Universities compared with **DEOD** (**U** or **D** is better)									
1st 10	Sig U	Sig U	U	Sig U	Sig U	Sig U	Sig U	U	U
2nd 10	D	D	D	D	Sig U	Alike	D	Alike	D
21→	Sig U	Sig U	N/A	N/A	N/A	U	U	U	N/A

Sig - Significant Differences ~ - alternating **N/A** - Insufficient Data

Table 16: Comparison of Individual MOC Retention by YCS

YCS	INF MOC23	ANAV MOC31	PILOT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
ROTP compared with DEO (R or D is better)										
1st10	~	~	Sig R	R	Sig D	~	~	Sig D	~	Sig ~
2nd10	D	R	Sig R	D	D	D	D	D	D	D
21→	N/A	N/A	Sig R	N/A	N/A	N/A	N/A	N/A	D	N/A
ROTP compared with OCTP (R or O is better)										
1st10	~	~	Sig R	N/A	N/A	N/A	N/A	N/A	~	Sig ~
2nd10	O	~	R	N/A	Sig O	N/A	N/A	N/A	O	O
21→	O	N/A	R	N/A	Sig O	N/A	N/A	N/A	O	~
DEO compared with OCTP (D or O is better)										
1st10	D	D	O	N/A	N/A	N/A	N/A	N/A	Alike	D
2nd10	D	Sig O	Sig O	N/A	Sig O	N/A	N/A	N/A	Alike	D
21→	N/A	N/A	Sig O	N/A	N/A	N/A	N/A	N/A	O	N/A
ROTP/CMC compared with ROTP/Civilian Universities (M or U is better)										
1st10	U	~	Sig ~	M	~	N/A	~	M	~	~
2nd10	U	M	M	~	M	~	U	M	U	M
21→	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ROTP/Civilian Universities compared with DEOD (U or D is better)										
1st10	U	~	Sig ~	N/A	~	~	U	Sig D	Sig ~	Sig D
2nd10	U	N/A	Sig ~	N/A	N/A	N/A	~	N/A	D	D
21→	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Sig - Significant Differences ~ - alternating **N/A** - Insufficient Data

Table 17: Comparison of Individual MOC Retention by YOS

YOS	INF MOC23	ANAV MOC31	PILOT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
ROTP compared with DEO (**R** or D is better)										
1st10	R	~	Sig R	Sig R	R	R	R	~	R	Sig ~
2nd10	D	D	Sig R	R	D	~	R	D	Alike	D
21→	N/A	N/A	Sig R	N/A	N/A	N/A	N/A	N/A	R	N/A
ROTP compared with OCTP (**R** or **O** is better)										
1st10	Sig R	R	Sig R	N/A	N/A	N/A	N/A	N/A	R	~
2nd10	O	R	Sig R	N/A	Sig O	N/A	N/A	N/A	R	O
21→	O	Sig R	Sig R	N/A	Sig O	N/A	N/A	N/A	O	O
DEO compared with OCTP (**D** or **O** is better)										
1st10	D	D	~	N/A	N/A	N/A	N/A	N/A	D	D
2nd10	D	D	O	N/A	Sig O	N/A	N/A	N/A	D	D
21→	N/A	N/A	Sig O	N/A	N/A	N/A	N/A	N/A	Sig O	N/A
ROTP/CMC compared with ROTP/Civilian Universities (**M** or **U** is better)										
1st10	M	M	Sig M	Sig M	M	N/A	~	M	M	M
2nd10	U	Sig M	Sig M	M	M	M	Alike	M	Alike	M
21→	N/A	N/A	M	~	~	N/A	N/A	N/A	~	N/A
ROTP/Civilian Universities compared with DEOD (**U** or **D** is better)										
1st10	U	~	Sig U	N/A	N/A	N/A	Sig U	~	U	~
2nd10	U	N/A	Sig U	N/A	N/A	N/A	U	N/A	Alike	D
21→	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	U	N/A

Sig - Significant Differences ~ - alternating **N/A** - Insufficient Data

Average Length of Service

49. **General** The average (the numerical mean) years of retention for officers that joined the CF through the different commissioning plans are tabulated according to the MOC groups in **Tables 18 and 19** and the individual MOCs in **Tables 20 and 21** by YCS and by YOS respectively. In these Tables the shortest retention is identified in bold print, and the longest is italicized.

50. **Minor Commissioning Plan Comparison** When examined by YCS the retention of UTPM officers has always been good, best in all but the MARS MOC. This retention pattern reflects the ten years or so that these officers have already served in the ranks. The shorter YOS retention of UTPM officers reflects the better employment opportunities available to individuals with a degree. Special commissioning plan and CFR officers are personnel committed to the CF, and having accepted a commission, they frequently continue to serve as long as they can before CRA, aspects reflected by both short YCS and long YOS retention.

Table 18: Group Retention Rates
Mean (Average) Years of Commissioned Service

PLANS	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
Minor Commissioning Plans									
CFR	10.8	10.7	11.9	9.3	---	10.6	10.4	**10.0**	13.0
UTPM	*13.5*	*14.2*	*16.4*	---	---	*13.2*	*12.8*	*13.2*	---
Others	**4.7**	**4.3**	**4.2**	---	---	**2.8**	**2.7**	---	---
Major Commissioning Plans									
ROTP	16.0	*17.9*	**15.2**	**18.2**	*17.8*	**14.5**	**14.9**	**15.0**	16.1
DEO	**15.8**	**16.2**	16.5	19.4	**14.1**	15.5	16.4	*16.2*	**13.8**
OCTP	*18.0*	*17.9*	*19.5*	*20.4*	16.7	*20.8*	*23.4*	15.9	*18.2*
ROTP (by College Type) and DEOD Commissioning Plans									
CMC	16.2	*18.3*	16.2	**17.9**	*18.2*	*14.6*	*14.8*	**14.4**	*17.0*
Civ U	**15.8**	**17.2**	**15.1**	*19.1*	16.2	14.2	**14.1**	15.7	**16.1**
DEOD	*16.5*	17.6	*17.0*	18.8	**15.6**	14.2	14.4	*16.8*	---

Shortest Retention is in Bold
Best Retention is Italicized

Table 19: Group Retention Rates
Mean (Average) Years of Service

PLANS	ALL	OPS	NAVAL	COMBAT ARMS	AIR OPS	ENGINEER	NON-MAR ENGINEER	SUPPORT	MINOR
Minor Commissioning Plans									
CFR	*27.7*	*29.6*	*27.4*	29.9	---	*27.6*	27.8	*26.3*	29.2
UTPM	23.8	**20.8**	25.9	---	---	**24.2**	**23.8**	**24.7**	---
Others	**23.0**	23.1	**23.8**	---	---	26.7	*28.8*	---	---
Major Commissioning Plans									
ROTP	*19.7*	*21.3*	19.0	*21.8*	*21.2*	18.6	19.2	*18.5*	19.5
DEO	**17.2**	**17.6**	**17.5**	**20.4**	**15.8**	**16.7**	**17.7**	17.2	**15.9**
OCTP	19.5	19.3	*21.0*	21.7	18.1	*24.3*	*26.9*	**16.5**	*20.2*
ROTP (by College Type) and DEOD Commissioning Plans									
CMC	*20.5*	*22.6*	*20.2*	*22.4*	*22.5*	*19.0*	*19.6*	*18.9*	*21.1*
Civ U	18.9	20.0	18.5	21.4	19.3	17.8	17.9	18.2	19.9
DEOD	**17.2**	**18.2**	**17.4**	**19.3**	**16.4**	**15.4**	**16.2**	**17.5**	---

Shortest Retention is in Bold
Best Retention is Italicized

51. **Major Commissioning Plan Comparison** The examination by YCS indicates that OCTP retention is generally the best, except in the air ops and support MOC groups and in the PLT MOC. ROTP retention is generally the shortest. In the MOC groups and individual MOCs where ROTP retention is not the shortest then DEO retention is generally the shortest. The examination by YOS indicates that DEO retention has generally been the shortest for both the MOC groups and the individual MOCs. ROTP retention by YOS is more frequently the longest.

52. **ROTP - CMC/Civilian University Comparison** The retention of ROTP officers has been best for those from CMC in all cases, except combat and the support MOC group and the INF and AERE MOCs. Similarly CMC retention has been best in all cases but the INF MOC.

53. **Civilian University - ROTP/DEOD Comparison** DEOD retention has generally been the longest, more so in the MOC groups than the individual MOCs. Retention by YOS has generally been shortest for DEOD. The obligatory service required of ROTP officers provides the simple explanation for the better YOS retention of those ROTP officers that attend civilian universities.

Table 20: MOC Retention Rates
Mean Years of Commissioned Service

PLANS	INF MOC23	ANAV MOC31	PLT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
Minor Commissioning Plans										
CFR	*9.7*	---	---	9.6	10.6	10.2	11.1	*11.7*	**9.6**	*14.6*
UTPM	---	---	---	*12.4*	*13.5*	---	---	---	*14.7*	14.4
Others	---	---	---	**2.7**	**2.7**	---	---	---	12.0	**4.3**
Major Commissioning Plans										
ROTP	**17.3**	18.9	*17.4*	*15.8*	**13.4**	**15.0**	**12.7**	**14.8**	**14.8**	**17.6**
DEO	18.3	**17.1**	**13.4**	**14.7**	15.3	*18.1*	*13.6*	*17.8*	15.8	18.9
OCTP	*19.6*	*19.1*	16.1	---	*24.2*	---	---	---	*16.7*	*19.9*
ROTP (by College Type) and DEOD Commissioning Plans										
CMC	16.7	*19.3*	*17.6*	15.5	*13.2*	*14.4*	*14.2*	15.2	**14.2**	18.4
Civ U	*19.8*	**17.3**	15.4	*15.6*	12.5	*14.4*	**13.3**	**13.9**	15.5	**16.7**
DEOD	**16.6**	---	**14.5**	**14.3**	**12.4**	**14.2**	14.0	*16.2*	*16.3*	*19.9*

Shortest Retention is in Bold
Best Retention is Italicized

Table 21: MOC Retention Rates
Mean Years of Service

PLANS	INF MOC23	ANAV MOC31	PLT MOC32	AERE MOC41	CELE MOC42	LEME MOC43	MARE MOC44	MILE MOC45	LOG MOC69	MARS MOC71
Minor Commissioning Plans										
CFR	*29.1*	---	---	28.0	*29.1*	28.0	26.6	25.5	*25.8*	29.5
UTPM	---	---	---	**23.8**	**24.1**	---	---	---	24.4	**23.6**
Others	---	---	---	*32.1*	27.8	---	---	---	**18.5**	*30.2*
Major Commissioning Plans										
ROTP	20.7	*22.7*	*20.6*	*20.0*	18.0	*19.3*	*17.0*	*18.8*	*18.3*	21.1
DEO	**19.5**	**20.0**	**14.8**	**16.2**	**17.4**	**18.6**	**14.6**	**18.5**	**16.8**	**20.1**
OCTP	*20.8*	20.5	17.5	---	*27.7*	---	---	---	17.2	*21.2*
ROTP (by College Type) and DEOD Commissioning Plans										
CMC	21.1	*24.3*	*22.0*	*20.2*	*18.3*	*19.0*	*18.3*	*19.6*	*18.7*	*22.8*
Civ U	*22.1*	**19.9**	18.6	18.7	16.9	17.9	16.6	**17.4**	18.0	**20.5**
DEOD	**17.7**	---	**15.2**	**15.8**	**14.4**	**14.8**	**13.9**	17.8	**17.1**	20.7

Shortest Retention is in Bold
Best Retention is Italicized

PART IV - CONCLUDING MATERIAL

SUMMARY

54. The ultimate purpose of the MCMC study was to determine the career progression of officers from the CMC relative to other officers in the CF. Because of the complexities of CF service, this examination has been expanded to look at the progression and retention of all officers by their commissioning plan--whatever it may have been. Officers from the CMC are a sub-set of those officers that joined through ROTP, so ROTP officers as a whole have been compared against others that entered some other way. The other sub-set of ROTP officers are those that took their education through civilian universities. This sub-set was compared, not only against their CMC counterparts, but also against the other group that received a civilian university education--the DEOD officers.

55. Growth in trained effective officer strength within the CF has been achieved mostly through ROTP and DEO commissioning plans. ROTP growth has been mainly due to the increased number of officers from the CMC. The representation of officers from the CMC increased with the capacity and the attraction of the CMC following an expansion in degree-granting authority. Officers now can graduate from any of the three colleges with a degree recognized by academia.

56. Generally, the analysis indicates that there have been significant differences between commissioning plans with respect to promotion rates. Promotion rates have been generally higher for ROTP officers as compared to those commissioned through either OCTP or DEO. Statistical tests did not reveal any significant differences in promotion rates for ROTP graduates from CMCs and civilian universities.

57. Retention patterns are influenced by such factors as obligatory service, generally low attrition during IE and increased attrition as officers approach CRA. Notwithstanding, the analysis shows that officers commissioned through OCTP generally have had better retention. In a comparison of CMC and civilian university graduates, retention for CMC officers has been generally better.

CONCLUSIONS

58. The conclusions derived from this study are presented in the following subparagraphs corresponding to the structure of the analysis:

a. the strength of the CF officer population has changed over time:

  (1) the trained effective strength has increased since 1978 in all of the officer MOCs studied except air ops,

  (2) the number of ROTP and DEO officers has increased in all MOCs, while the number of CFR officers has decreased, and

  (3) the number of ROTP officers from CMC has increased in all MOCs studied, while the number of ROTP officers from civilian universities has increased only in the MARE MOC and in the minor MOC group;

b. as a result of the changes in the population the commissioning plan distributions have also shifted:

  (1) the representation of both ROTP and DEO officers have increased at the expense of the other commissioning plans,

  (2) the proportion of OCTP officers has increased only in the MARS MOC and in the minor MOC group, and

  (3) DEO representation has increased predominantly in the junior officer ranks while ROTP representation has increased predominantly in the senior officer ranks;

c. more specifically, when considering the proportion of ROTP graduates from CMC versus civilian universities, the following changes have occurred:

    (1) the proportions of CMC and civilian university graduates have shifted from a 60/40 split in 1978 to a 75/25 split by 1993 in the operational MOCs,

    (2) the proportions of CMC and civilian university graduates have also shifted in the engineering MOCs from a 60/40 split in 1978 to an 80/20 split by 1993, and

    (3) in the support and minor MOCs the proportions of CMC and civilian university graduates have shifted from a 50/50 split in 1978 to a 65/35 split by 1993;

d. when examining career progression in terms of promotion rates very little was derived from the analysis on individual MOCs due to small numbers. MOC groups however have revealed interesting trends including:

    (1) promotion rates for ROTP officers have been generally better than rates for either DEO or OCTP officers, and significantly so in most MOC groups,

    (2) promotion rates to the rank of Maj for DEO officers have been higher than those for OCTP officers but the promotion rates have been similar to the higher ranks, and

    (3) ROTP graduates from CMC and civilian universities have experienced similar promotion rates except to the rank of Col where CMC graduates have enjoyed higher promotion rates;

e. some general observations on retention patterns in the CF include:

    (1) officers from the minor commissioning plans, CFR and LDO in particular, are commissioned late in their careers and remain in the CF for only a short period of time. Therefore, it is not useful to compare retention patterns from these plans with those from the major commissioning plans (ROTP, DEO and OCTP),

    (2) obligatory service strongly influences retention patterns in the early stages of an officer's career,

(3) regardless of commissioning plan attrition is low after 9 YCS while officers are on an IE, and

(4) after 20 YOS differences in retention patterns by commissioning plan do emerge as attrition increases towards CRA; and

f. comparative analysis of retention patterns for the individual MOCs revealed little due once again to small numbers. General trends in retention for MOC groups do indicate:

(1) retention of ROTP officers is better than DEO or OCTP while they attend CMC and complete their period of obligatory service. Thereafter high attrition from ROTP results in lower retention to 9 YCS,

(2) retention of OCTP officers is better than for both DEO and ROTP after 9 YCS, significantly so in the engineering MOCs. The exception occurs in air ops where ROTP retention is significantly better,

(3) retention of ROTP officers from CMCs is better than for ROTP officers from civilian universities and significantly so in air ops. The exceptions are in the combat arms and support MOC groups, and

(4) retention of ROTP officers from civilian universities as compared to that for DEOD officers is better during the period of obligatory service and after 20 YOS.

METHODOLOGY

INTRODUCTION

1. This annex describes the methodology used for the comparative analysis of career progression and officer retention by commissioning plan in support of a request from the Ministerial Committee on the Canadian Military Colleges (MCMC).

SCOPE

2. It was apparent from the tasking that the study would be based on historical data covering the period from 1978 to 1992 inclusive. From preliminary discussions with the MCMC it was also determined that the analytical results were to include discussion for specific individual military occupations (MOC):

a. armoured (ARMD) - MOC 21;

b. artillery (ARTY) - MOC 22;

c. infantry (INF) - MOC 23;

d. air navigator (ANAV) - MOC 31;

e. pilot (PLT) - MOC 32;

f. aerospace engineering (AERE) - MOC 41;

g. communications and electronic engineering (CELE) - MOC 42;

h. land electrical and mechanical engineering (LEME) - MOC 43;

j. maritime engineering (MARE) - MOC 44;

k. military engineering (MILE) - MOC 45;

m. air traffic control (ATC) - MOC 63;

n. air weapons control (AWC) - MOC 64;

o. personnel administration (PADM) - MOC 68[1];

p. logistics (LOG) - MOC 69;

q. maritime surface and sub-surface (MARS) - MOC 71;

r. security (SEC) - MOC 81; and

s. intelligence (INT) - MOC 82[2].

3. The Directorate of Manpower Analysis's (D Man A) experience with historical trend analysis suggested that some of these MOCs would be too small for any meaningful analysis so it was felt that MOCs should be aggregated in a systematic manner. The MOC groups for analysis included:

a. all officers;

b. operational MOCs - MOCs 21, 22, 23, 31, 32 and 71;

c. naval MOCs - MOCs 44 and 71;

d. combat arms - MOCs 21, 22 and 23;

e. air operations (air ops) - MOCs 31 and 32;

f. engineers - MOCs 41, 42, 43, 44 and 45;

g. non-maritime engineers - MOCs 41, 42, 43 and 45;

h. support MOCs - MOCs 68 and 69;

j. minor MOCs - MOCs 63, 64, 81 and 82;

k. air controllers - MOCs 63 and 64;

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[1] PADM - MOC 68 data did not show up until 1979 following its creation.

[2] MOC 82 - INT was too small for valid statistical testing; and until 1983 it existed as a sub-component of MOC 81- SEC. The two were therefore recombined in this study.

m. security and intelligence - MOCs 81 and 82;

n. a combination of all those MOCs identified for individual examination: MOCs 21, 22, 23, 31, 32, 41, 42, 43, 44, 45, 63, 64, 68, 69, 71, 81 and 82; and

o. a combination of all other MOCs not included above: MOCs 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 65, 66, 67, 72, 73, 74, 75, 76, 77 and 79.

4. While the MCMC wished to examine the career progression and retention characteristics of graduates of the Canadian Military College (CMC) system, these individuals had to be examined in the context of all other officers within the Canadian Forces (CF). Consequently the analysis was to encompass the following commissioning plans:

a. regular officer training plan (ROTP) (these officers obtain a degree while in the CF);

b. direct entry officer (DEO) with a degree (DEOD) (these officers obtain a degree before joining the CF);

c. DEO with a diploma (DEOP) (these officers obtain a diploma before joining the CF);

d. officer cadet training plan (OCTP) from military status (OCTPM) and from civilian status (OCTPC) combined;

e. university training plan for non-commissioned members (UTPM);

f. commissioned from the ranks (CFR); and

g. others (consisting mainly of unknowns and of limited duty CFR officers (LDO) for those military occupations (MOCs) under study, and of specialist officer commissioning plans for some of the other MOCs).

5. The analysis also had to be broken down by college type (ie CMC or civilian university) for a proper comparative analysis of career progression and retention patterns of ROTP graduates.

DATA EXTRACTION

6. It was clear from the tasking and the scope of the problem that massive data extractions would be required. Familiarity with the Military Personnel Information System (MPIS) data elements combined with the requirements of the MCMC resulted in a decision to approach the data extraction in two phases:

a. the first phase to enable analysis of career progression of officers from various commissioning plans; and

b. the second phase to permit analysis of retention patterns for officers from the various commissioning plans by years of commissioned service (YCS) and by years of service (YOS).

7. The historical active tapes of the MPIS were the source of all data used for the career progression analysis; and the MPIS release tapes provided attrition data required for the retention analysis. All extracted data were confined to the post-1977 period, since the MPIS tapes prior to 1978 proved to contain incomplete data on the commissioning plan under which officers were enrolled.

8. For commonality throughout the study data were extracted by:

a. rank;

b. commissioning plans;

c. college types as recorded in the MPIS under the 'university' field;

d. MOCs identified for individual assessment; and

e. MOCs identified for assessment collectively in MOC groups.

9. For the career progression phase of the analysis the population was restricted to the trained effective strength less those on extension. 'Trained' was defined for the whole study as those assigned to an MOC but not annotated within the MPIS as being untrained[3]. Data were extracted from the 1977 to 1992 year-end tapes (inclusive); and were sorted by MOC, by commissioning plan and by rank.

10. Data for the career progression analysis of the minor commissioning plans (UTPM, CFR and 'others') encompassed:

a. the strength count; and

b. the promotion count.

11. The more detailed career progression analysis associated with the major commissioning plans (ROTP, DEO and OCTP) and with the CMC/civilian university comparison for ROTP officers encompassed combinations of commissioning plan and college types that included:

a. OCTP with all recorded college types combined;

b. DEO with both DEO(D) and DEO(P) combined;

c. DEO(D) with all recorded college types combined;

d. ROTP from CMC;

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[3] i.e. the MOC alphanumeric code does not end with a 'U', and the MOC is not 98 (under training) or 99 (not allotted).

e. ROTP from civilian university; and

f. ROTP from unknown/undefined sources.

12. Within each of these combinations of commissioning plan and college type, data extracted and sorted by MOC and by rank included:

a. the strength count;

b. the promotion count;

c. the time in rank (TIR) distribution (0 to 15+ years); and

d. the time in previous rank (TIPR) distribution (0 to 15+ years).

13. The data obtained for the retention analysis consisted of:

a. attrition data obtained from the MPIS release tape. Separate records for each trained officer that was recorded as having been released between 1 January 1978 and 31 December 1992 were obtained[4]. The extraction included:

(1) MOC, (as one of the 17 individual MOCs identified above, or as others),

(2) commissioning plan,

(3) college type,

(4) YCS,

(5) YOS,

(6) rank at release, and

(7) release year; and

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[4] Data on General (Gen) rank officers (all officers above the Col/Capt(Navy) (Capt(N)) rank) - MOCs 11 and 12 - had to be included with data of the MOC from which each originated for an accurate analysis of retention.

b. strength data obtained from the MPIS annual historical tapes. The data were aggregated over the period 1978 to 1992 and were sorted by MOC, commissioning plan, college type and rank. The extraction from the trained effective strength of officers encompassed all officers not on extension.

ANALYTICAL CONSIDERATIONS

Promotion Rate Analysis

14. In an analysis of promotion rates, an automatic but inaccurate tendency is to compare the number promoted to the population from which they were elevated. However, only the eligible sub-set of any rank population can provide officers for promotion. For the purposes of this study, eligibility was based solely on a minimum TIR[5] criterion that varies with rank:

a. Colonel (Col) - at least two years[6];

b. Lieutenant Colonel (LCol) - at least three years;

c. Major (Maj) - at least four years;

d. Captain (Capt) - at least four years; and

e. Lieutenant (Lt) - at least three years.

15. Promotion to the rank of Capt is based predominantly on seniority, and there is little to segregate it from an automatic advancement. On the other hand promotion to senior

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[5] TIR is the difference between the end of the year and the date of the last promotion.

[6] There is no minimum TIR prior to promotion from the rank of Col, but the observed minimum has never been less than two years. Within D Man A a minimum has therefore been applied for the purposes of all manpower related studies and models.

ranks (i.e. Maj, LCol and Col) is by selection; the number of officers at each of the higher ranks is controlled. This study was limited to an examination of promotion rates to the senior ranks only, where rates may be meaningful.

Retention Analysis

16. A good retention profile can be obtained from average attrition rate information. The total number of releases occurring at each YCS (or YOS) is divided by the strength in each YCS (or YOS). This method provides a reliable means of comparing commissioning plan retention in a quantitative fashion since each point in the profile is standardized to the strength at that point. Appendix A1 contains the accumulated release data that were used for generating the retention profiles.

DATA PRE-PROCESSING IN BASIC[7]

17. The way in which data was obtained from the MPIS required further aggregation prior to final processing for analysis. Pre-processing was accomplished on a number of powerful desk-top computers using BASIC to split the extremely large files extracted from the MPIS into separate MOC-specific data, and then to:

- a. prepare the data for the career progression analysis of ROTP and the CMC/civilian university comparison by aggregating:
  - (1) TIR data across all college types to obtain overall ROTP totals,

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[7] BASIC (beginner's all-purpose symbolic instruction code) is a simple computer programming language excellent for file manipulation.

(2) TIR data to yield the eligibility strength, and

(3) TIR data across all years in rank to yield the total strength; and

b. prepare the data for the retention analysis by:

(1) aggregating the releases over all ranks for the years of 1978 to 1992,

(2) combining the release data for individual MOCs into multiple MOC groupings, and

(3) aggregating strengths over all ranks.

SPREADSHEET DATA CALCULATIONS

18. Following data extraction and pre-processing, final production of tables and curves for analysis was accomplished through Lotus[8] spreadsheets. Five Lotus spreadsheets were developed for the career progression analysis of this study, and two spreadsheets for the retention analysis.

19. The five Lotus spreadsheets designed to produce rank totals and sub-totals for representation, eligibility and promotion rates in the career progression analysis phase of the study were:

a. a strength spreadsheet into which strength data organized by commissioning plan, college type, rank and year (i.e. each historical year for which data were extracted) were imported to produce:

(1) rank totals, and

(2) junior[9] and senior rank sub-totals;

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[8] Lotus is a registered trademark of Lotus Development Corporation.

[9] Junior - ranks from Lt to Capt.

b. a distribution spreadsheet into which strength data from the strength spreadsheet were copied to generate annual strengths distributed by the commissioning plans of ROTP, DEO, OCTP and the 'rest' (i.e. all other commissioning plans) for:

  (1) all ranks combined,

  (2) senior ranks, and

  (3) junior ranks;

c. a TIR spreadsheet into which the eligible and total TIR data were retrieved to calculate:

  (1) yearly eligibility rates by rank, for ranks from Capt to LCol. Eligibility rates are ratios of those eligible for promotion from a given MOC, rank and commissioning plan, to the MOC and commissioning plan total for that rank, and

  (2) eligibility rates as 5-year moving averages to obtain larger numbers and to smooth out annual fluctuations. The rates were calculated as the number eligible within a 5-year period divided by the total of the annual strengths (at the beginning of each year) within the period;

d. a promotion spreadsheet into which promotion data sorted by commissioning plan, college type and rank were retrieved to produce:

  (1) rank totals, and

  (2) junior and senior rank sub-totals; and

e. a promotion rate spreadsheet into which eligible strengths and promotion data, from the TIR and promotion spreadsheets, were retrieved to calculate:

  (1) yearly promotion rates by rank. Each rate was calculated as the annual number of promotions for an MOC and commissioning plan, divided by the annual eligible strength at the beginning of each year, and

(2) promotion rates as 5-year moving averages so as to obtain larger numbers and to smooth out annual fluctuations. These rates were calculated as the number of promotions within a 5-year period divided by the total of the annual eligible strengths (at the beginning of each year) within the period.

20. The two Lotus spreadsheets developed from the total trained strength for the retention analysis were:

a. a retention by YCS spreadsheet into which YCS data, organized by MOC, commissioning plan and college type, were imported to produce:

(1) yearly attrition rates for each combination. Each rate was calculated as the annual number of releases from each group, divided by the trained effective strength of that group at the beginning of each year,

(2) the probability of survival to each YCS, which is obtained by accumulating those that remain (the survivors) as a percentage after annual attrition at each YCS has been removed[10], and

(3) the retention curve, which is a plot of survival to each YCS in turn; and

b. a retention by YOS spreadsheet, identical to the YCS spreadsheet above, using YOS data.

GRAPHICAL DATA PRESENTATION

21. From what has been outlined above, it is apparent that a great deal of tabular data was generated. To assimilate this mass of data for analysis it had to be presented in a more amenable manner, so a series of line and

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[10] Where S_x = survival in year x
AR_{x+1} = attrition rate in the year after year x,
then
$S_{x+1} = S_x (1 - AR_{x+1})$

bar graphs was generated for selected commissioning plans, for officer ranks below Gen, and for specific MOCs and MOC groups.

22. All graphs generated in Harvard Graphics[11] (HG) from data within Lotus spreadsheets depict historical trends by juxtaposing yearly data. Four broad areas which conform to the major topics for analysis are depicted: commissioning plan representation, eligibility rates, promotion rates and retention. The graphs generated in HG were:

a. comparative commissioning plan representation graphs of trained effective strength including:

    (1) line graphs depicting the strength for the minor commissioning plans of UTPM, CFR and 'others',

    (2) line graphs depicting the strength for the major commissioning plans of ROTP, DEO and OCTP, and

    (3) bar graphs depicting the strength distribution by commissioning plan of:

        (a) total of all officers,

        (b) junior officers, and

        (c) senior officers;

b. comparative line graphs of commissioning plan eligibility rates (5-year moving averages) for each rank from Capt to LCol for:

    (1) the major commissioning plans of ROTP, DEO and OCTP, and

    (2) ROTP sub-divided by college type to compare CMC with civilian university;

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[11] Harvard Graphics is a registered trademark of Software Publishing Corporation.

c. comparative HG line graphs of promotion rates (5-year moving averages) to each of the senior ranks by commissioning plan for:

  (1) the major commissioning plans of ROTP, DEO and OCTP, and

  (2) ROTP sub-divided by college type to compare CMC with civilian university; and

d. comparative commissioning plan line graphs of retention by YCS and YOS for:

  (1) the minor commissioning plans of UTPM, CFR and 'others',

  (2) the major commissioning plans of ROTP, DEO and OCTP,

  (3) ROTP officers (those from CMC and civilian universities viewed separately), and

  (4) civilian university commissioning plans (ROTP [just civilian university ROTP] and DEOD).

STATISTICAL TESTS

23. Data for all ranks and MOC groupings were submitted to a series of two-sided tests producing results at the 95 percent confidence level. Tests for the comparison of proportions were made to:

a. determine whether promotion rates (5-year moving averages) of officers from different commissioning plans were comparable; and

b. determine whether retention of officers from different commissioning plans was comparable.

24. To be able to perform the statistical tests noted above the number of officers (e.g. strength) in each rank cell needed to be larger than 30. In this study 5-year moving averages were used to increase cell size samples for promotion

rates. Where the promotion rate samples were still too small, statistical tests were performed on promotion rates averaged over all years.

25. For the results of statistical tests to be significant it is necessary that there be a small variation around the value of the statistic used. A small variation is generally obtained when the size of the sample being tested is large. When the sample size is small the variation could be large, and a large variation leads to an inconclusive outcome of the test.

SUMMARY

26. Although this outline seems to cover a lot of ground, it describes but a fraction of the information available. Policy issues and decisions require much more detail than mere static snapshots of the personnel situation. The composition of the officer corps within the CF today is a result of policies both past and current. To address major concerns a decision maker must have a good understanding of the way the population has evolved historically. The historical trend analysis that was used in this study provides the decision maker with that understanding.

ACCUMULATED RELEASE DATA

1. Retention data for this study were first obtained by an accumulation process using all past releases from the Military Personnel Information System (MPIS) release tape. In the analysis these data were compared against strength data to obtain release rates. A summary of accumulated releases is tabulated according to university type as outlined below:

   a. Table A1-1: ROTP[1] - Accumulated Releases 78 - 92;

   b. Table A1-2: DEOD[2] - Accumulated Releases 78 - 92;

   c. Table A1-3: DEOP[3] - Accumulated Releases 78 - 92;

   d. Table A1-4: DEO[4] - Accumulated Releases 78 - 92;

   e. Table A1-5: UTPM[5] - Accumulated Releases 78 - 92;

   f. Table A1-6: OCTPC[6] - Accumulated Releases 78 - 92;

   g. Table A1-7: OCTPM[7] - Accumulated Releases 78 - 92;

   h. Table A1-8: OCTP[8] - Accumulated Releases 78 - 92;

   i. Table A1-9: CFR[9] - Accumulated Releases 78 - 92; and

   j. Table A1-10: Other Commissioning Plans - Accumulated Releases 1978 - 1992.

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[1] Regular Officer Training Plan

[2] Direct Entry Officer with a Degree

[3] Direct Entry Officer with a Diploma

[4] Direct Entry Officer

[5] University Training Plan for Non-Commissioned Members

[6] Officer Cadet Training Plan from Civilian Status

[7] Officer Cadet Training Plan from Military Status

[8] Officer Cadet Training Plan

[9] Commissioned From the Ranks

Table A1-1: ROTP - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	47	26	1	74
ARTY - 22	34	26	3	63
INF - 23	107	52	6	165
ANAV - 31	62	66	0	128
PLT - 32	204	129	5	338
AERE - 41	215	108	0	323
CELE - 42	204	105	4	313
LEME - 43	92	53	0	145
MARE - 44	131	62	19	212
MILE - 45	162	93	2	257
ATC - 63	6	8	0	14
AWC - 64	1	1	0	2
PADM - 68	15	11	0	26
LOG - 69	197	165	4	366
MARS - 71	97	41	26	164
SEC - 81	11	10	0	21
INT - 82	12	5	1	18
Other	30	153	16	199
TOTAL	1,627	1,114	87	2,828
MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	188	104	10	302
Air Ops	266	195	5	466
Engineers	804	421	25	1,250
Non Mar Eng	673	359	6	1,038
Air Contl	7	9	0	16
MARS/MARE	228	103	45	376
SEC/INT	23	15	1	39
All Ops	551	340	41	932

Table A1-2: DEOD - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	1	23	1	25
ARTY - 22	1	25	1	27
INF - 23	2	58	4	64
ANAV - 31	2	29	2	33
PLT - 32	3	134	16	153
AERE - 41	0	55	2	57
CELE - 42	3	68	2	73
LEME - 43	1	38	1	40
MARE - 44	5	88	4	97
MILE - 45	3	41	1	45
ATC - 63	0	24	2	26
AWC - 64	1	8	0	9
PADM - 68	1	30	0	31
LOG - 69	5	225	7	237
MARS - 71	1	62	5	68
SEC - 81	0	17	2	19
INT - 82	0	3	0	3
Other	3	527	91	621
TOTAL	32	1,455	141	1,628
MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	4	106	6	116
Air Ops	5	163	18	186
Engineers	12	290	10	312
Non Mar Eng	7	202	6	215
Air Contl	1	32	2	35
MARS/MARE	6	150	9	165
SEC/INT	0	20	2	22
All Ops	10	331	29	370

Table A1-3: DEOP - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	1	2	30	33
ARTY - 22	0	4	34	38
INF - 23	0	4	66	70
ANAV - 31	3	26	57	86
PLT - 32	2	25	270	297
AERE - 41	3	11	19	33
CELE - 42	2	6	37	45
LEME - 43	2	1	12	15
MARE - 44	0	7	27	34
MILE - 45	2	4	25	31
ATC - 63	0	4	38	42
AWC - 64	1	1	15	17
PADM - 68	0	4	17	21
LOG - 69	2	22	58	82
MARS - 71	0	3	42	45
SEC - 81	0	0	11	11
INT - 82	0	0	4	4
Other	0	80	276	356
TOTAL	18	204	1,038	1,260
MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	1	10	130	141
Air Ops	5	51	327	383
Engineers	9	29	120	158
Non Mar Eng	9	22	93	124
Air Contl	1	5	53	59
MARS/MARE	0	10	69	79
SEC/INT	0	0	15	15
All Ops	6	64	499	569

Table A1-4: DEO - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	2	25	31	58
ARTY - 22	1	29	35	65
INF - 23	2	62	70	134
ANAV - 31	5	55	59	119
PLT - 32	5	159	286	450
AERE - 41	3	66	21	90
CELE - 42	5	74	39	118
LEME - 43	3	39	13	55
MARE - 44	5	95	31	131
MILE - 45	5	45	26	76
ATC - 63	0	28	40	68
AWC - 64	2	9	15	26
PADM - 68	1	34	17	52
LOG - 69	7	247	65	319
MARS - 71	1	65	47	113
SEC - 81	0	17	13	30
INT - 82	0	3	4	7
Other	3	607	367	977
TOTAL	50	1,659	1,179	2,888
MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	5	116	136	257
Air Ops	10	214	345	569
Engineers	21	319	130	470
Non Mar Eng	16	224	99	339
Air Contl	2	37	55	94
MARS/MARE	6	160	78	244
SEC/INT	0	20	17	37
All Ops	16	395	528	939

Table A1-5: UTPM - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	0	2	0	2
ARTY - 22	0	0	0	0
INF - 23	0	1	1	2
ANAV - 31	1	5	0	6
PLT - 32	1	7	0	8
AERE - 41	11	68	0	79
CELE - 42	17	56	0	73
LEME - 43	2	3	0	5
MARE - 44	1	9	0	10
MILE - 45	3	15	0	18
ATC - 63	0	4	0	4
AWC - 64	0	2	0	2
PADM - 68	1	9	0	10
LOG - 69	18	76	1	95
MARS - 71	0	19	1	20
SEC - 81	0	10	0	10
INT - 82	2	1	0	3
Other	2	40	0	42
TOTAL	59	327	3	389
MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	0	3	1	4
Air Ops	2	12	0	14
Engineers	34	151	0	185
Non Mar Eng	33	142	0	175
Air Contl	0	6	0	6
MARS/MARE	1	28	1	30
SEC/INT	2	11	0	13
All Ops	2	34	2	38

Table A1-6: OCTPC - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	0	7	43	50
ARTY - 22	0	6	84	90
INF - 23	3	11	176	190
ANAV - 31	9	59	304	372
PLT - 32	4	61	859	924
AERE - 41	0	6	5	11
CELE - 42	2	12	12	26
LEME - 43	1	2	2	5
MARE - 44	0	20	7	27
MILE - 45	0	1	1	2
ATC - 63	0	2	58	60
AWC - 64	0	3	27	30
PADM - 68	1	8	22	31
LOG - 69	6	43	99	148
MARS - 71	0	13	173	186
SEC - 81	0	4	18	22
INT - 82	0	1	7	8
Other	2	28	26	56
TOTAL	28	287	1,923	2,238
MOC Group	**CMC**	**Civ U**	**Unknown**	**TOTAL**
Combat Arms	3	24	303	330
Air Ops	13	120	1,163	1,296
Engineers	3	41	27	71
Non Mar Eng	3	21	20	44
Air Contl	0	5	85	90
MARS/MARE	0	33	180	213
SEC/INT	0	5	25	30
All Ops	16	157	1,639	1,812

Table A1-7: OCTPM - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	0	1	14	15
ARTY - 22	0	1	21	22
INF - 23	0	7	53	60
ANAV - 31	0	4	50	54
PLT - 32	0	2	74	76
AERE - 41	0	2	0	2
CELE - 42	0	3	14	17
LEME - 43	0	1	1	2
MARE - 44	0	0	0	0
MILE - 45	0	0	0	0
ATC - 63	0	1	30	31
AWC - 64	0	1	8	9
PADM - 68	0	3	16	19
LOG - 69	3	11	57	71
MARS - 71	0	0	8	8
SEC - 81	0	1	6	7
INT - 82	0	1	1	2
Other	0	2	11	13
TOTAL	3	41	364	408
MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	0	9	88	97
Air Ops	0	6	124	130
Engineers	0	6	15	21
Non Mar Eng	0	6	15	21
Air Contl	0	2	38	40
MARS/MARE	0	0	8	8
SEC/INT	0	2	7	9
All Ops	0	15	220	235

Table A1-8: OCTP - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	0	8	57	65
ARTY - 22	0	7	105	112
INF - 23	3	18	229	250
ANAV - 31	9	63	354	426
PLT - 32	4	63	933	1,000
AERE - 41	0	8	5	13
CELE - 42	2	15	26	43
LEME - 43	1	3	3	7
MARE - 44	0	20	7	27
MILE - 45	0	1	1	2
ATC - 63	0	3	88	91
AWC - 64	0	4	35	39
PADM - 68	1	11	38	50
LOG - 69	9	54	156	219
MARS - 71	0	13	181	194
SEC - 81	0	5	24	29
INT - 82	0	2	8	10
Other	2	30	37	69
TOTAL	31	328	2,287	2,646
MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	3	33	391	427
Air Ops	13	126	1,287	1,426
Engineers	3	47	42	92
Non Mar Eng	3	27	35	65
Air Contl	0	7	123	130
MARS/MARE	0	33	188	221
SEC/INT	0	7	32	39
All Ops	16	172	1,859	2,047

Table A1-9: CFR - Accumulated Releases 78 - 92

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	0	0	30	30
ARTY - 22	0	0	33	33
INF - 23	0	2	81	83
ANAV - 31	0	0	19	19
PLT - 32	0	0	3	3
AERE - 41	1	9	239	249
CELE - 42	1	14	221	236
LEME - 43	0	2	71	73
MARE - 44	0	7	172	179
MILE - 45	0	3	86	89
ATC - 63	0	0	64	64
AWC - 64	0	4	86	90
PADM - 68	0	10	133	143
LOG - 69	0	13	285	298
MARS - 71	1	2	55	58
SEC - 81	0	4	58	62
INT - 82	0	0	9	9
Other	1	17	142	160
TOTAL	4	87	1,787	1,878
MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	0	2	144	146
Air Ops	0	0	22	22
Engineers	2	35	789	826
Non Mar Eng	2	28	617	647
Air Contl	0	4	150	154
MARS/MARE	1	9	227	237
SEC/INT	0	4	67	71
All Ops	1	4	221	226

Table A1-10: Other Commissioning Plans - Accumulated Releases 1978 - 1992

MOC	CMC	Civ U	Unknown	TOTAL
ARMD - 21	0	0	0	0
ARTY - 22	0	0	6	6
INF - 23	0	2	2	4
ANAV - 31	0	0	0	0
PLT - 32	0	0	0	0
AERE - 41	0	2	33	35
CELE - 42	0	1	37	38
LEME - 43	0	1	16	17
MARE - 44	0	0	19	19
MILE - 45	0	0	14	14
ATC - 63	0	0	0	0
AWC - 64	0	0	0	0
PADM - 68	0	3	0	3
LOG - 69	0	10	10	20
MARS - 71	0	0	25	25
SEC - 81	0	0	2	2
INT - 82	0	0	0	0
Other	1	698	79	778
TOTAL	1	717	243	961

MOC Group	CMC	Civ U	Unknown	TOTAL
Combat Arms	0	2	8	10
Air Ops	0	0	0	0
Engineers	0	4	119	123
Non Mar Eng	0	4	100	104
Air Contl	0	0	0	0
MARS/MARE	0	0	44	44
SEC/INT	0	0	2	2
All Ops	0	2	33	35

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This Minister of National Defence created the "Committee on the Canadian Military Colleges" to examine the return on investment for the Canadian Forces (CF) of the Canadian Military College (CMC) system. The Directorate of Manpower Analysis was tasked to analyze officer career progression and retention in specific military occupations (MOCs) according to the commissioning plan by which the serving officer joined the regular force component.

This project report is broken into three volumes. Volume I contains the detailed analysis of CF officers as a whole followed by a discussion on the overall study results. Volume II contains the detailed analysis of each of the MOC groups examined, and Volume III contains the detailed analysis of each of the individual MOCs studied.

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CANADA

OPERATIONAL RESEARCH AND ANALYSIS
DIRECTORATE OF MANPOWER ANALYSIS

PROJECT REPORT 649

AN EXAMINATION OF OFFICER RETENTION AND CAREER PROGRESSION ACCORDING TO DIFFERENT COMMISSIONING PLANS WITHIN THE CANADIAN FORCES

VOLUME II: ANALYSIS OF OCCUPATIONAL GROUPS

by

P. Bender
A. Chouinard
Capt A.D. Lee
L. Tanner
S. Tseng

December 1993

OTTAWA, CANADA

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ABSTRACT

The Minister of National Defence created the "Committee on the Canadian Military Colleges" to examine the return on investment for the Canadian Forces (CF) of the Canadian Military College (CMC) system. The Directorate of Manpower Analysis was to analyze officer career progression and retention in specific military occupations with particular attention to whether the officer attended a CMC.

The promotion characteristics and retention profiles for CF officers are examined in this project report according to the commissioning plan by which the serving officer joined the regular force component. In addition, graduates under the regular officer training plan from the CMC system are compared against those that have attended civilian universities.

This project report is broken into three volumes. Volume I contains the detailed analysis of CF officers as a whole followed by a discussion on the overall study results. Volume II contains the detailed analysis of each of the MOC groups examined, and Volume III contains the detailed analysis of each of the individual MOCs studied.

RÉSUMÉ

Le ministre de la défense nationale a mis sur pied "le comité ministériel sur les Collèges militaires du Canada" afin d'examiner l'apport aux Forces canadiennes (FC) du système des collèges militaires. La Direction d'Analyse des Effectifs dut analyser la progression de carrière des officiers et leur rétention dans certaines occupations en prenant soin de distinguer les officiers gradués des collèges militaires.

Dans ce rapport de projet les tendances dans les taux de promotion et les caractéristiques de rétention dans les FC sont examinées selon les programmes de formation pour officiers de la force régulière. De plus, une comparaison est faite entre les officiers gradués des universités civiles et ceux des collèges militaires.

Ce rapport de projet est divisé en trois volumes. Volume I contient l'analyse détaillée sur les officiers des FC suivi d'une discussion sur les résultats globals de l'étude. Volume II contient l'analyse détaillée de chaque regroupement de GPM, et Volume III porte sur l'analyse détaillée des GPM individuels.

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Support MOCs . . . . G - 8

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Support MOCs . . . . G - 9

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G - 9 ROTP Retention Curves
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G - 10 Civilian University Retention Curves
Support MOCs . . . . G - 12

H - 1 Trained Effective Strength
All Commissioning Plans - Minor MOCs
Ranks - Lt to Col . . . . H - 1

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H - 3 Eligibility Rates - Major Plans
5-year Moving Averages
Minor MOCs . . . . H - 5

H - 4 ROTP Eligibility Rates
5-year Moving Averages
Minor MOCs . . . . H - 6

H - 5 Promotion Rates - Major Plans
5-year Moving Averages
Minor MOCs . . . . H - 8

H - 6 ROTP Promotion Rates
5-year Moving Averages
Minor MOCs . . . . H - 9

H - 7 Minor Plan Retention Curves
Minor MOCs . . . . H - 10

H - 8 Major Plan Retention Curves
Minor MOCs . . . . H - 11

H - 9 ROTP Retention Curves
Minor MOCs . . . . H - 12

H - 10 Civilian University Retention Curves
Minor MOCs . . . . H - 13

TERMINOLOGY

For the purposes of this report, the following definitions apply:

Attrition Rate: A ratio, the numerator consisting of all releases from the trained strength of a group of officers in the Canadian Forces (CF) within a period; the denominator consisting of the trained effective strength of that group at the beginning of the period.

Canadian Military Colleges: The system of military colleges in Canada that consists of: the Royal Military College (RMC) in Kingston, Ontario; Royal Roads Military College (RRMC) in Victoria, British Columbia; and le Collège Militaire Royal (CMR) de Saint-Jean, Québec.

Eligibility Rate: A ratio, the numerator consisting of all individuals eligible for promotion out of a given rank; the denominator consisting of the total for that rank. It is calculated at a specific point in time.

Experience Profile: The distribution of the trained effective strength of a group of officers in the CF by years of commissioned service or by years of service.

Promotion Rate: A ratio, the numerator consisting of the number of officers promoted out of a given rank within a period; the denominator consisting of the eligible strength at the beginning of the period.

Retention Profile: A graph that depicts the survival probability of a group of officers as a function of experience measured by years of commissioned service or by years of service.

Time in Previous Rank Profile: Within the specific officer group being examined, it is the distribution of the strength of that group by the time spent in the previous rank.

Time in Rank Profile: Within the specific officer group being examined, it is the distribution of the strength of that group by the time spent in the current rank.

ABBREVIATIONS

AERE	Aerospace Engineering - MOC 41
ADM(Per)	Assistant Deputy Minister (Personnel)
air ops	Air Operations
ANAV	Air Navigator - MOC 31
ARMD	Armoured - MOC 21
ARTY	Artillery - MOC 22
ATC	Air Traffic Control - MOC 63
AWC	Air Weapons Control - MOC 64
Capt	Captain
Capt(N)	Captain (Navy)
CELE	Communications and Electronic Engineering - MOC 42
Cdr	Commander
CF	Canadian Forces
CFR	Commissioned From the Ranks
CMC	Canadian Military Colleges
CMR	Collège Militaire Royal
Col	Colonel
CPRM	Chief Personnel Policy Planning and Resource Management
CRA	Compulsory Retirement Age
DEO	Direct Entry Officer
DEOD	Direct Entry Officer with a Degree
DEOP	Direct Entry Officer with a Diploma
DGPP	Director General Personnel Policy
D Man A	Directorate of Manpower Analysis
DND	Department of National Defence
FRP	Forces Reduction Plan
Gen	General
HG	Harvard Graphics (Registered Trade Mark)
IE	Intermediate Engagement
INF	Infantry - MOC 23
INT	Intelligence - MOC 82

IPS	Indefinite Period of Service
LCdr	Lieutenant-Commander
LCol	Lieutenant-Colonel
LDO	Limited Duty CFR Officer
LEME	Land Electrical and Mechanical Engineering - MOC 43
LOG	Logistics - MOC 69
Lt	Lieutenant
Lt(N)	Lieutenant (Navy)
Maj	Major
MARE	Maritime Engineering - MOC 44
MARS	Maritime Surface and Sub-Surface - MOC 71
MCMC	Ministerial Committee on the Canadian Military Colleges
MILE	Military Engineering - MOC 45
MND	Minister of National Defence
MOC	Military Occupation
MPIS	Military Personnel Information System
NCM	Non-Commissioned Member
NDHQ	National Defence Headquarters
OCDP	Officer Career Development Plan
OCTP	Officer Cadet Training Plan
OCTPC	Officer Cadet Training Plan from Civilian Status
OCTPM	Officer Cadet Training Plan from Military Status
OPI	Office of Prime Interest
PADM	Personnel Administration - MOC 68
PLT	Pilot - MOC 32
RETP	Reserve Entry Training Plan
RMC	Royal Military College
ROTP	Regular Officer Training Plan
RRMC	Royal Roads Military College
SE	Short Engagement
SEC	Security - MOC 81
TIR	Time in Rank

TIPR	Time in Previous Rank
UTPM	University Training Plan for Non-Commissioned Members
YCS	Years of Commissioned Service
YOS	Years of Service

LIST OF REFERENCES

1 NDHQ Action Directive D1/93 dated 5 Jan 93.

2 Exec Dir Memorandum 1150-110/M88 to the Chief Personnel Policy Planning and Resource Management (CPRM) dated 19 Jan 93, with a minute to the Director General Personnel Policy (DGPP) on 21 Jan 93, and to D Man A on 22 Jan 93.

AN EXAMINATION OF OFFICER RETENTION AND CAREER PROGRESSION ACCORDING TO DIFFERENT COMMISSIONING PLANS WITHIN THE CANADIAN FORCES
VOLUME II: ANALYSIS OF OCCUPATIONAL GROUPS

BACKGROUND

1. In 1876 the Royal Military College (RMC) in Kingston Ontario, opened as the first of the Canadian Military Colleges (CMC). In 1948 Royal Roads Military College (RRMC), a Royal Canadian Navy institution in Victoria British Columbia, joined the CMC system when it accepted cadets from the other two services. Le Collège Militaire Royal (CMR) de Saint-Jean Québec became the third jewel in the CMC crown in 1952 when it joined the CMC system under the auspices of the Royal Canadian Air Force. A degree-granting charter was bestowed on the RMC by Ontario in 1959, RRMC obtained its charter from British Columbia in 1975 and Québec conferred degree-granting status to CMR in 1986.

2. The role of the CMC within the Department of National Defence (DND) is to educate and train officer cadets and commissioned officers for a career in the Canadian Forces (CF). The majority of officer cadets attending the CMC do so under the regular officer training plan (ROTP). The remainder are enroled under the reserve entry training plan (RETP) and the university training plan [non-commissioned members (NCM)] (UTPM).

3. On 17 December 1992 the Minister of National Defence (MND) created the "Committee on the Canadian Military Colleges" (MCMC) to examine the return on investment of the CMC system. A subsequent directive (Reference 1) appointed the Assistant Deputy Minister (Personnel) (ADM(Per)) as the Departmental office of prime interest (OPI). Following a

meeting with the Executive Director for the MCMC on 18 January 1993, the Directorate of Manpower Analysis (D Man A) was tasked (Reference 2) with providing an analysis of both officer retention and career progression rates in specific military occupations (MOC) according to the various CF commissioning plans; with specific attention to whether the officer attended CMC.

4. The MCMC requested that an initial analysis of retention be completed by 12 February 1993, with final analysis of promotion rates and of retention to be completed by mid-March. Following an extension to the MCMC mandate, D Man A also received an extended deadline.

AIM

5. The aim of this study was to provide the MCMC with an analysis of officer career progression and retention by commissioning plan. This report documents the results of this analysis.

SCOPE

6. While the MCMC wished to examine the status of graduates of the CMC system, these individuals had to be examined in the context of all officers within the CF. Volume I of this project report encompasses the overall results of the study. Tabulated strength data for all officers, and data for just those officers that entered the CF through ROTP, are presented first. A more detailed examination is then made of all CF officers. The strength of the group and the distribution within the group by commissioning plans were first inspected, followed by an examination of the ROTP -

CMC/civilian university composition, before analyzing the critical aspects of:

a. eligibility rates;

b. promotion rates; and

c. retention.

7. This approach is repeated in Volume III for individual MOCs which were large enough to provide sufficient data for analysis.

8. In this volume the following MOC groups were analyzed:

a. Annex A - All Operational MOCs (MOCs 21, 22, 23, 31, 32 and 71);
b. Annex B - Naval MOCs (MOCs 44 and 71);
c. Annex C - Combat Arms MOCs (MOCs 21, 22 and 23);
d. Annex D - Air Operations MOCs (MOCs 31 and 32);
e. Annex E - Engineering MOCs (MOCs 41, 42, 43, 44 and 45);
f. Annex F - Engineering MOCs Less MARE (MOCs 41, 42, 43 and 45);
g. Annex G - Support MOCs (MOCs 68 and 69); and
h. Annex H - Minor MOCs (MOCs 63, 64, 81 and 82).

SUMMARY

9. The ultimate purpose of the MCMC study was to determine the career progression of officers from the CMC relative to other officers in the CF. Because of the complexities of CF service, this examination has been expanded to look at the progression and retention of all officers by their commissioning plan--whatever it may have been. Officers from the CMC are a sub-set of those officers that joined

through ROTP, so ROTP officers as a whole have been compared against others that entered some other way. The other sub-set of ROTP officers are those that took their education through civilian universities. This sub-set was compared, not only against their CMC counterparts, but also against the other group that received a civilian university education--the DEOD officers.

10. Growth in trained effective officer strength within the CF has been achieved mostly through ROTP and DEO commissioning plans. ROTP growth has been mainly due to the increased number of officers from the CMC. The representation of officers from the CMC increased with the capacity and the attraction of the CMC following an expansion in degree-granting authority. Officers now can graduate from any of the three colleges with a degree recognized by academia.

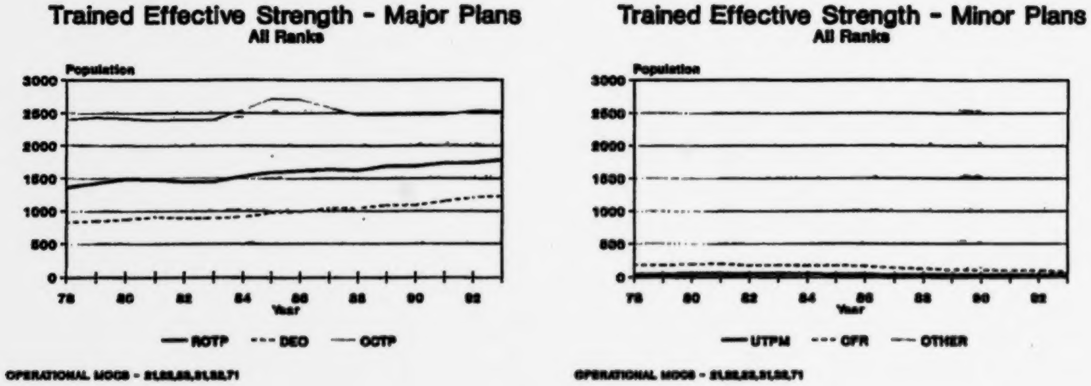
11. Generally, the analysis indicates that there have been significant differences between commissioning plans with respect to promotion rates. Promotion rates have been generally higher for ROTP officers as compared to those commissioned from either OCTP or DEO. There is no significant difference in promotion rates for ROTP graduates from CMCs and civilian universities.

12. Retention patterns are influenced by such factors as obligatory service, generally low attrition during IE and increased attrition as officers approach CRA. Notwithstanding, the analysis shows that officers commissioned through OCTP generally have had better retention. In a comparison of CMC and civilian university graduates, retention for CMC officers has been generally better.

ALL OPERATIONAL OCCUPATIONS

Strength

1. The operational MOCs as a whole grew by 18 percent in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in **Figure A - 1**, were:



Trained Effective Strength - Major Plans
All Ranks

Trained Effective Strength - Minor Plans
All Ranks

**Figure A - 1: Trained Effective Strength
All Commissioning Plans - All Operations MOCs
Ranks - Lt to Col**

a. ROTP - a continuous increase of 31 percent between 1978 and 1993;

b. DEO - a steady increase of 49 percent;

c. OCTP - an overall increase of five percent over the period, with a minor growth from 1983 to 1985, followed by a decrease between 1986 and 1988;

d. UTPM - relatively stable, with little change over the period;

e. CFR - an overall decrease of 52 percent, resulting from reductions between 1981 and 1982 and from 1985 to 1993; and

f. other plans - a dramatic increase due to small numbers (i.e. from one to 20).

Commissioning Plan Distribution

2. Because there were changes in the composition of the operational MOCs as a whole, commissioning plan distributions in the period from 1978 to 1993 were also examined and showed:

a. for all officers:

  (1) ROTP - a proportion of 28 percent in 1978 increased smoothly to 31 percent by 1993,

  (2) DEO - a proportion of 17 percent in 1978 increased to 22 percent by 1993,

  (3) OCTP - a proportion of 50 percent in 1978 decreased to a proportion of 44 percent by 1993, and

  (4) minor plans combined - a proportion of five percent in 1978 decreased to three percent by 1993 (despite the increased numbers);

b. for junior officers:

  (1) ROTP - a proportion of 29 percent in 1978 decreased to 27 percent by 1993, having been 31 percent and 24 percent in the interim,

  (2) DEO - a proportion of 15 percent in 1978 increased to 23 percent by 1993,

  (3) OCTP - a proportion of 50 percent in 1978 decreased to 47 percent by 1993, having been 47 percent and 53 percent in the interim, and

  (4) minor plans combined - a proportion of six percent in 1978 decreased to three percent by 1993; and

c. for senior officers:

  (1) ROTP - a proportion of 26 percent in 1978 increased to 39 percent by 1987, and stayed level until 1993,

(2) DEO - a proportion of 21 percent in 1978 decreased to 17 percent and then returned to 19 percent by 1993,

(3) OCTP - a proportion of 49 percent in 1978 decreased to 39 percent by 1993, and

(4) minor plans combined - remained level at three percent.

ROTP - CMC/Civilian University

3. ROTP numbers in general increased by 31 percent in the operational MOCs as a whole. The CMC component increased by 58 percent, while civilian university ROTP graduates decreased by 20 percent (**Figure A - 2**). Between 1978 and 1993, CMC graduates went from representing 61 to 73 percent of ROTP officers in the operational MOCs; civilian university ROTP graduates decreased their representation from 38[1] to 23[1] percent of ROTP officers.

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[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

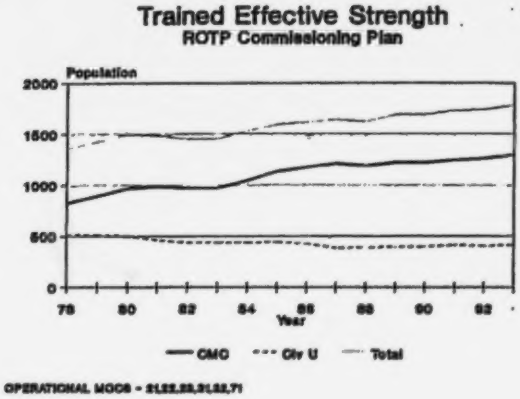

Figure A - 2: Trained Effective Strength
ROTP - All Operations MOCs
Ranks - Lt to Col

Eligibility Rates

4. **Major Plans** Eligibility rates for OCTP officers have been generally higher than those for either DEO or ROTP officers, while the ROTP eligibility rates have generally been the lowest (**Figure A - 3**). At the LCol rank, the DEO eligibility varied considerably. Eligibility rates in all plans have increased since the 1990 FRP was introduced.

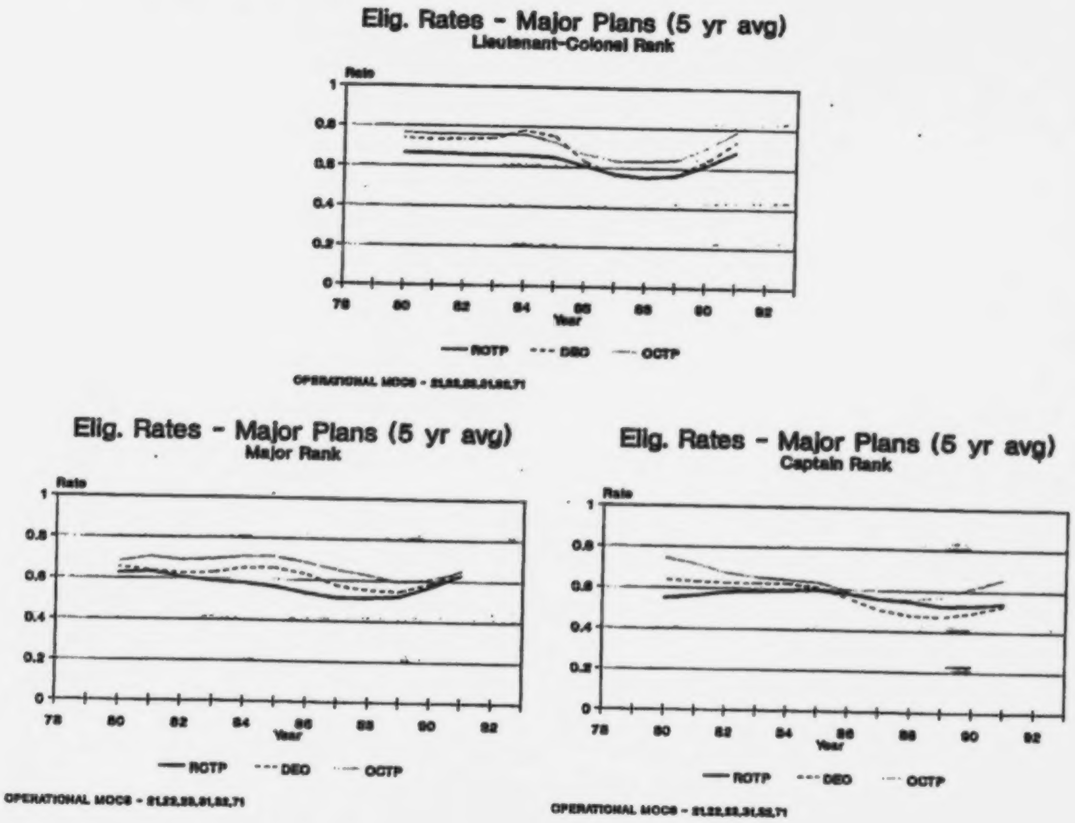

Figure A - 3: Eligibility Rates - Major Plans
5-year Moving Averages
All Operations MOCs

5. ROTP - CMC/Civilian University Eligibility rates for CMC graduates in the operational MOCs have been lower at all three ranks (**Figure A - 4**). Eligibility rates for ROTP officers from both sources increased since 1990 when the introduction of the FRP produced a drop in the number of promotions.

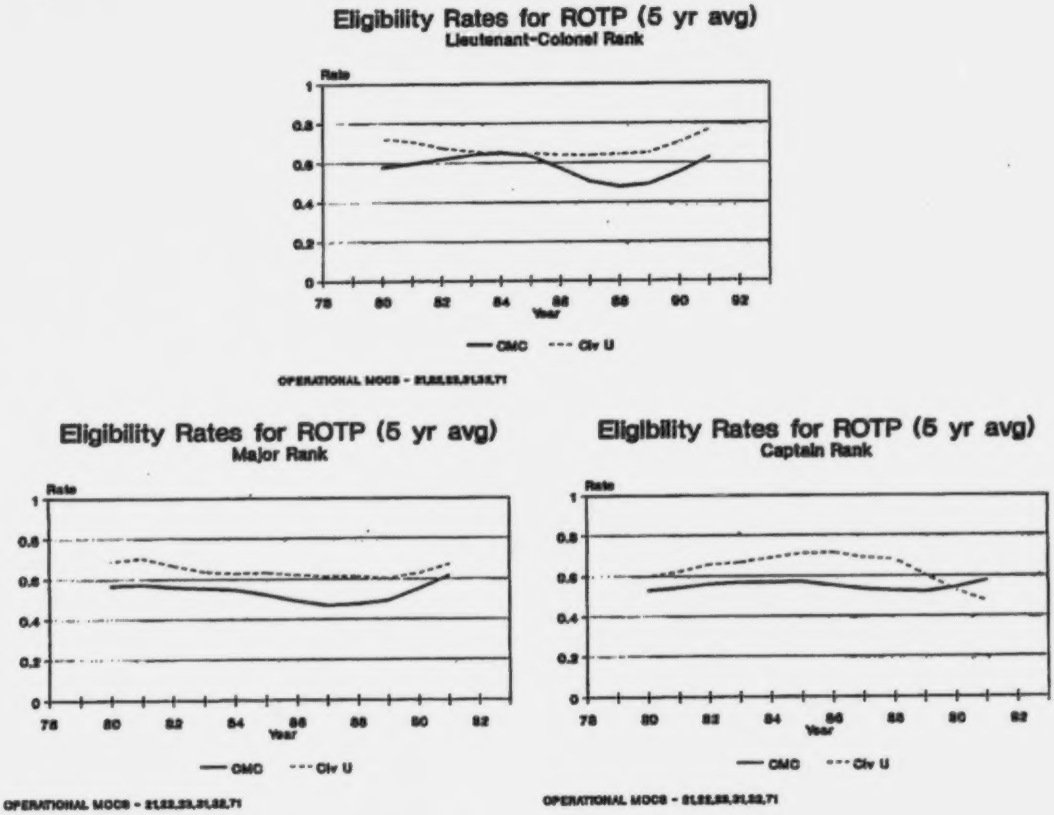

Figure A - 4: ROTP Eligibility Rates
5-year Moving Averages
All Operations MOCs

Promotion Rates

6. **Major Plans** In the operational MOCs ROTP promotion rates have consistently been higher at all rank levels (**Figure A - 5**). ROTP/DEO rates of promotion to the Maj and LCol ranks, and ROTP/OCTP rates of promotion to the three senior ranks were significantly[2] different. DEO/OCTP rates of promotion to the rank of Maj have also been significantly different, but for the other two ranks DEO rates were close to those of OCTP. The drop in rates at all rank levels over the last few years is probably related to the 1990 FRP.

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[2] All statements on statistical significance are tested at the 95 percent confidence level.

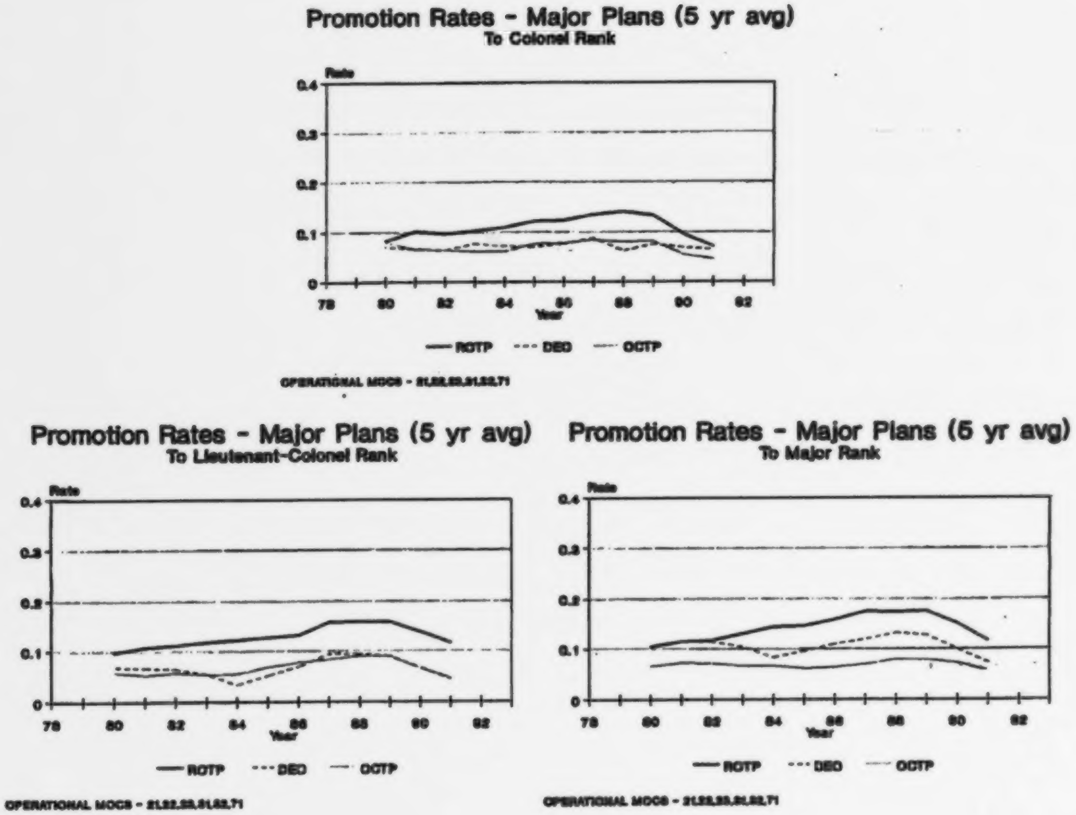


Figure A - 5: Promotion Rates - Major Plans
5-year Moving Averages
All Operations MOCs

7. ROTP - CMC/Civilian University CMC promotion rates in the operational MOCs were consistently higher only at the Col rank, however the statistical tests on differences were inconclusive. A recent decline in rates apparent at all ranks is probably related to the FRP (Figure A - 6).

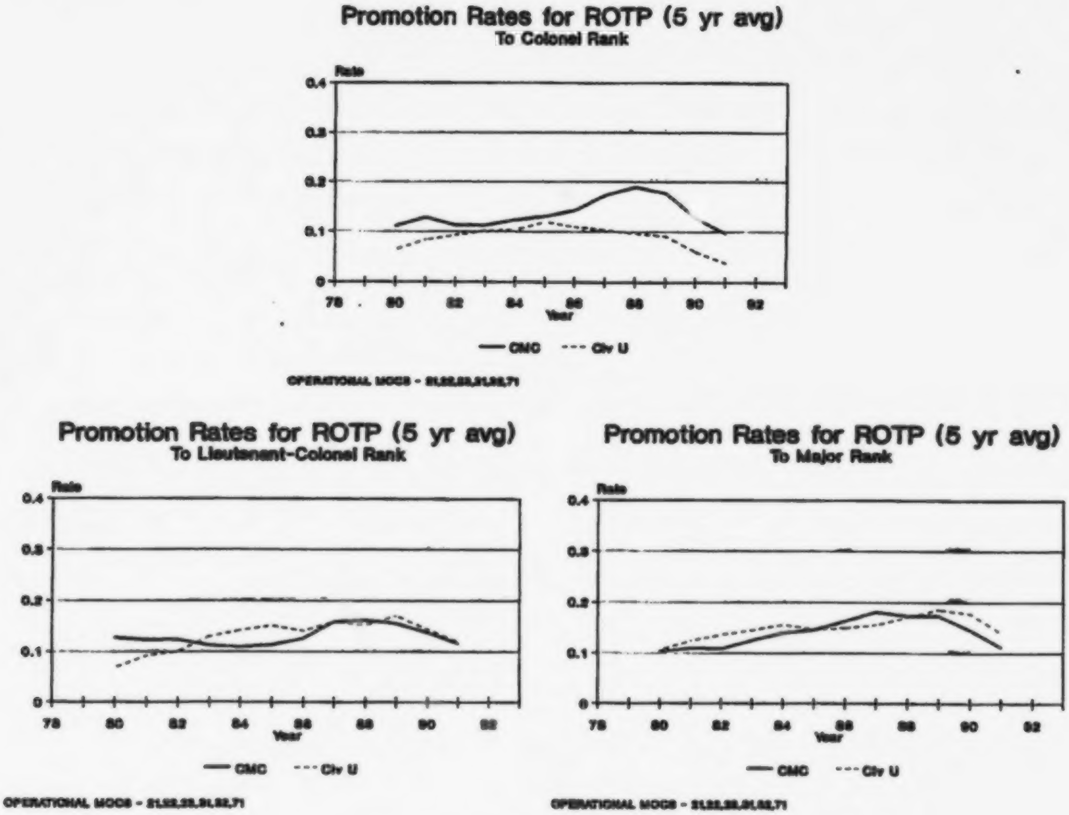


Figure A - 6: ROTP Promotion Rates
5-year Moving Averages
All Operations MOCs

Retention

8. **Minor Plans** The minor plan retention curves reveal that the average length of service for officers in the operational MOCs was 14.2 YCS (20.8 YOS) for UTPM officers, 10.7 YCS (29.6 YOS) for CFR officers, and 4.3 YCS (23.1 YOS) for those commissioned under the 'other' plans (**Figure A - 7**).

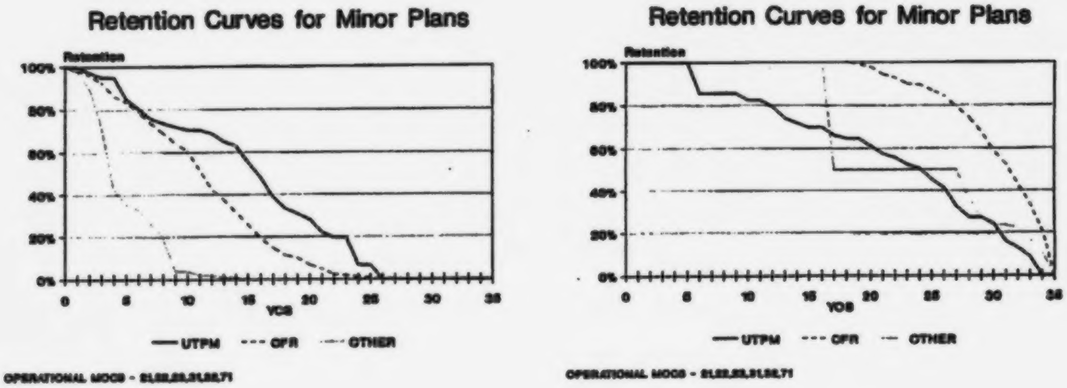


Figure A - 7: Minor Plan Retention Curves
All Operations MOCs

9. **Major Plans** For the operational MOCs, the ROTP obligatory service of three years was apparent in the YCS plot, at which point ROTP attrition increased (**Figure A - 8**). Both ROTP/DEO and ROTP/OCTP retention were significantly different until six YCS. Early DEO and OCTP attrition rates were lower and were similar, and retention for all three plans levelled at the start of the IE. On the YOS curves about 60 percent of DEO and OCTP and 65 percent of ROTP officers were still serving at 20 YOS. All three plans showed an increase in attrition and significantly different retention from the start of the IPS. The average length of service was 17.9 YCS (21.3 YOS) for ROTP officers, 16.2 YCS (17.6 YOS) for DEO officers and 17.9 YCS (19.3 YOS) for OCTP officers.

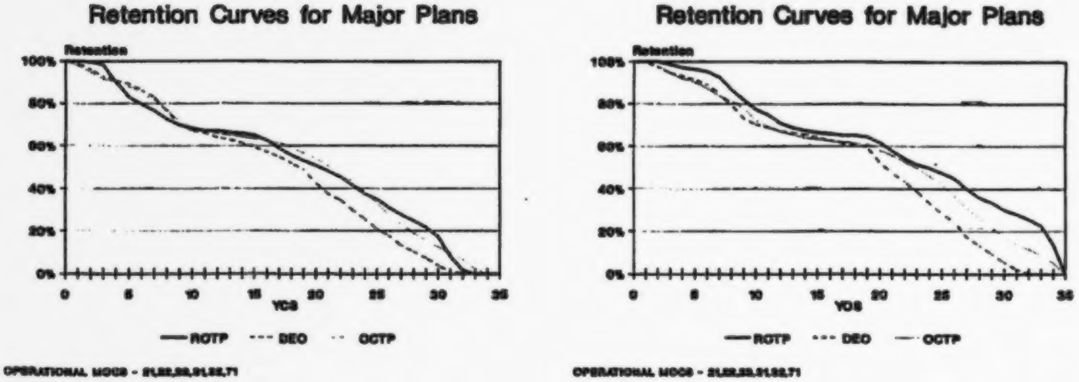
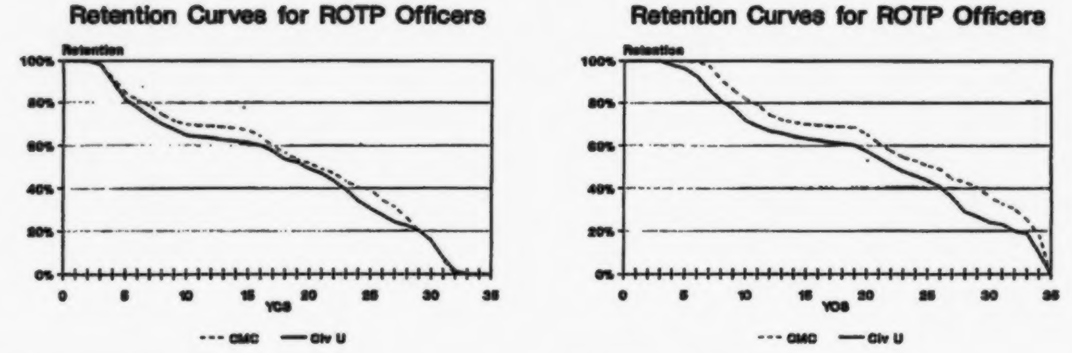


Figure A - 8: Major Plan Retention Curves
All Operations MOCs

10. ROTP - CMC/Civilian University In operational MOCs the YCS retention curves for ROTP officers were similar for the first four YCS, but attrition for civilian university officers continued to be high (**Figure A - 9**). Retention for all ROTP officers levelled slightly at ten YCS, with few taking advantage of the gratuity offered at nine YCS. Retention was significantly different until 20 YOS, at which point about 69 percent of CMC and 62 percent of civilian university officers remained. From the start of the IPS until 26 YOS both plans had similar retention characteristics, but officers from civilian universities had a significantly greater propensity to leave thereafter. For ROTP officers from CMC the average length of service was 18.3 YCS (22.6 YOS); for ROTP officers from civilian universities it was 17.2 YCS (20.1 YOS).



OPERATIONAL MOCS - 21,22,23,31,32,71

OPERATIONAL MOCS - 21,22,23,31,32,71

**Figure A - 9: ROTP Retention Curves
All Operations MOCs**

11. **Civilian University - ROTP/DEOD** Of those in operational MOCs that attended civilian universities, DEOD officers experienced fairly consistent attrition until 20 YCS (YOS), whereas attrition for ROTP officers started following three years of obligatory service and was high until five YCS (**Figure A - 10**). On the YCS plot, DEOD attrition only slowed after the IE. YOS retention was significantly different, with about 65 percent of DEOD and 62 percent of ROTP officers remaining to 20 YOS. DEOD attrition was far higher during the IPS, retention remaining statistically different from that point. The average length of service for officers in the operational MOCs was 17.2 YCS (20.1 YOS) for ROTP officers and 17.6 YCS (18.2 YOS) for DEOD officers.

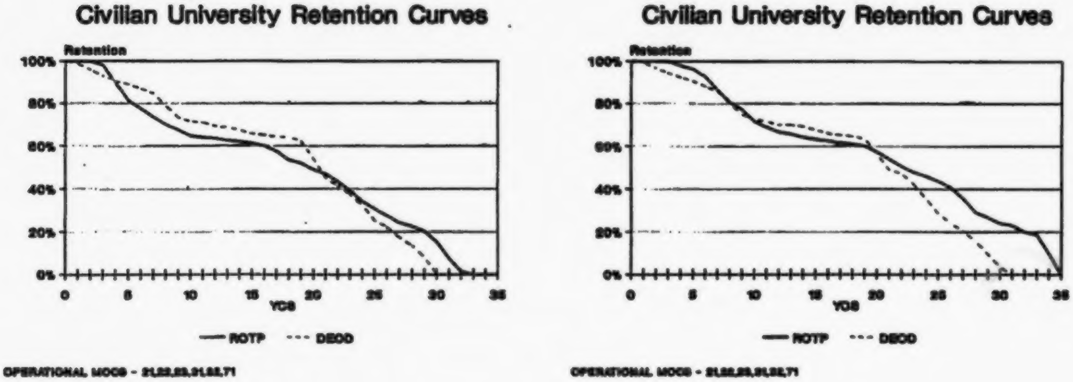
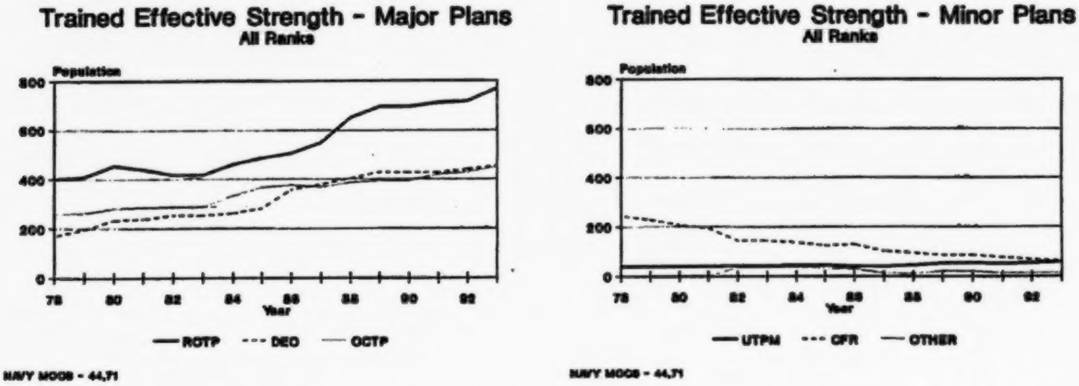


Figure A - 10: Civilian University Retention Curves All Operations MOCs

NAVAL OCCUPATIONS

Strength

1. The naval officer population grew by 62 percent in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in **Figure B - 1**, were:


Trained Effective Strength - Major Plans
All Ranks

Trained Effective Strength - Minor Plans
All Ranks

**Figure B - 1: Trained Effective Strength
All Commissioning Plans - Naval MOCs
Ranks - SLt to Capt(N)**

a. ROTP - an increase of 92 percent starting in 1983;

b. DEO - a continuous increase of 168 percent over the period;

c. OCTP - a gradual increase of 74 percent over the period;

d. UTPM - an increase of 44 percent over the period, with most of it since 1987;

e. CFR - a continuous decrease of 75 percent over the period; and

f. other plans - an infinite increase from none until 1982 to 13 by 1993.

Commissioning Plan Distribution

2. Because there were changes in the composition of the naval MOCs, commissioning plan distributions in the period from 1978 to 1993 were also examined and showed:

a. for all officers:

   (1) ROTP - a proportion of 36 percent in 1978 increased to 43 percent by 1993,

   (2) DEO - a proportion of 15 percent in 1978 increased gradually to 25 percent by 1993;

   (3) OCTP - a proportion of 23 percent in 1978 increased gradually to 27 percent by 1985, decreased to 23 percent in 1989 before returning to 25 percent by 1993, and

   (4) minor plans combined - a proportion of 26 percent in 1978 decreased to seven percent by 1993;

b. for junior officers, where more variation is apparent because recruitment patterns are reflected at these ranks:

   (1) ROTP - a proportion of 38 percent in 1978 increased to 42 percent by 1993, but dropped to as low as 32 percent in the interim,

   (2) DEO - a proportion of 13 percent in 1978 increased to 25 percent by 1993, having been as high as 28 percent in 1987,

   (3) OCTP - a proportion of 23 percent in 1978 increased to 27 percent by 1993, having been as high as 32 percent in 1985, and

   (4) minor plans combined - a proportion of 26 percent in 1978 decreased to seven percent by 1993; and

c. changes in distributions for senior officers in naval MOCs occurred smoothly between 1978 and 1993:

(1) ROTP - a proportion of 34 percent increased to 44 percent,

(2) DEO - a proportion of 18 percent increased to 26 percent,

(3) OCTP - a proportion of 23 percent in 1978 decreased to 20 percent from 1982 to 1987, then increased to 22 percent by 1993, and

(4) minor plans combined - a proportion of 25 percent decreased to nine percent.

ROTP - CMC/Civilian University

3. ROTP numbers in the naval MOCs increased by 92 percent. The CMC component increased by 128 percent, mainly since 1983; while civilian university ROTP graduates increased by only 11 percent starting in 1987 (**Figure B - 2**). Between 1978 and 1993, CMC graduates went from representing 63 to 75 percent of ROTP naval officers; civilian university ROTP graduates decreased their representation from 34[1] to 19[1] percent.

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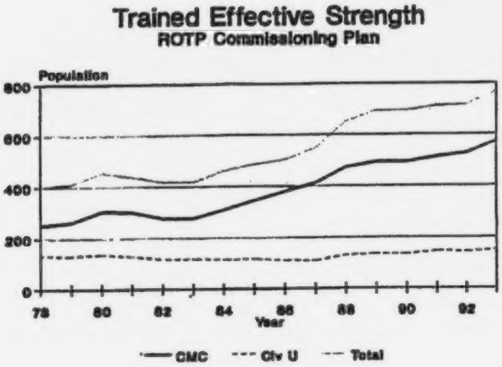
[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

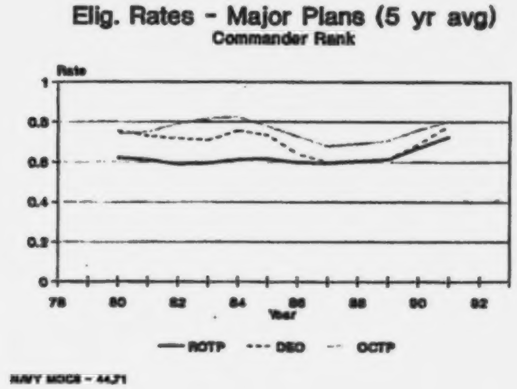


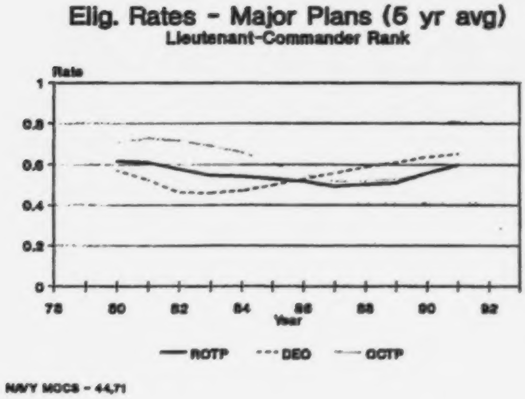
NAVY MOCS - 44,71

Figure B - 2: Trained Effective Strength
ROTP - Naval MOCs
Ranks - SLt to Capt(N)

Eligibility Rates

4. **Major Plans** Naval MOC OCTP eligibility rates have generally been highest, while the ROTP eligibility rates have generally been the lowest (**Figure B - 3**). Eligibility rates for all plans have increased at all ranks since the FRP was introduced.





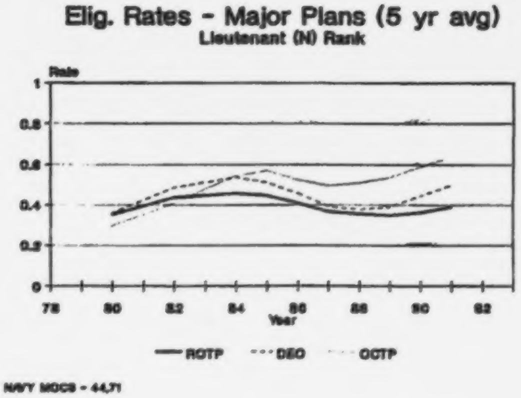
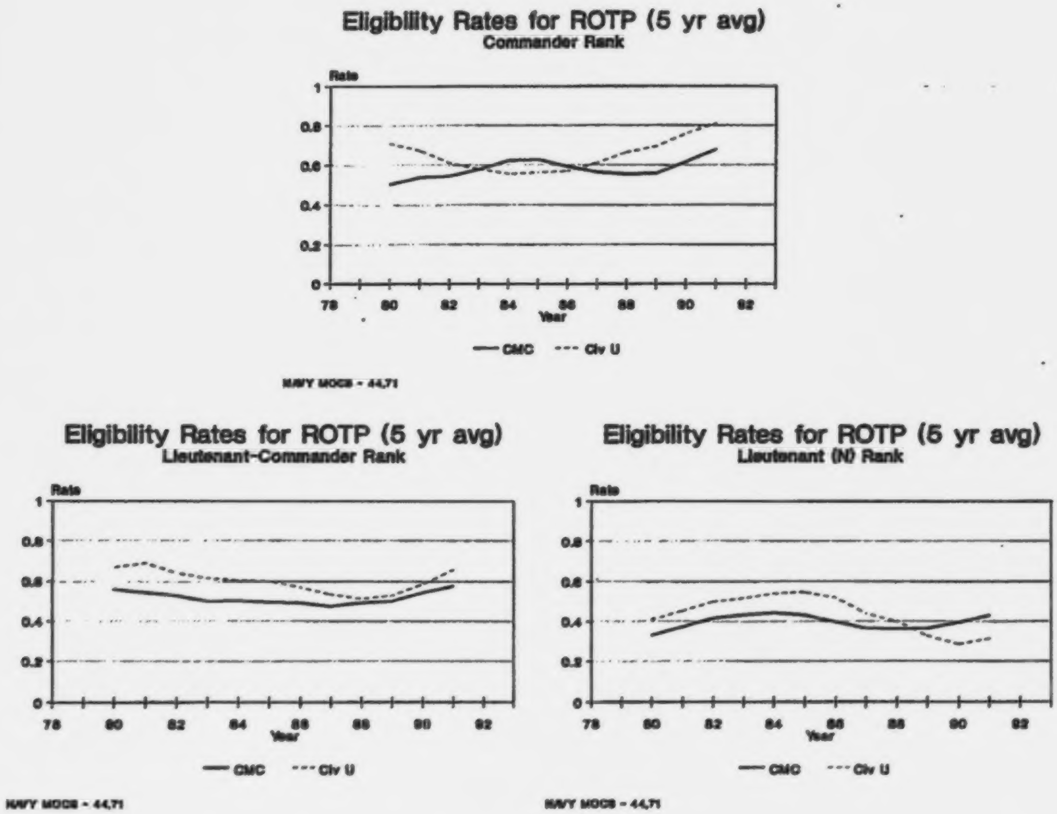


Figure B - 3: Eligibility Rates - Major Plans
5-year Moving Averages
Naval MOCs

5. ROTP - CMC/Civilian University Eligibility rates for CMC graduates in the naval MOCs have been generally lower at all three ranks (**Figure B - 4**). Eligibility rates for ROTP officers from both sources have increased since the FRP was introduced.


Eligibility Rates for ROTP (5 yr avg)
Commander Rank

NAVY MOCS - 44,71

Eligibility Rates for ROTP (5 yr avg)
Lieutenant-Commander Rank

NAVY MOCS - 44,71

Eligibility Rates for ROTP (5 yr avg)
Lieutenant (N) Rank

NAVY MOCS - 44,71

**Figure B - 4: ROTP Eligibility Rates
5-year Moving Averages
Naval MOCs**

Promotion Rates

6. **Major Plans** Promotion rates to Lieutenant-Commander(LCdr) for ROTP officers have been generally the highest, while OCTP promotion rates have been significantly[2] the lowest (Figure B - 5). For DEO officers, rates of promotion to LCdr were similar to those for ROTP officers until 1984, then declined to near OCTP levels. Rates of promotion to Commander (Cdr) for DEO and OCTP officers were similar, and both were significantly different from the higher ROTP rates of promotion. Promotion rates to the rank of Navy Captain (Capt (N)) were similar for all three plans. The drop in rates for all rank levels over the last few years is conceivably related to the FRP.

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[2] All statements on statistical significance are tested at the 95 percent confidence level.

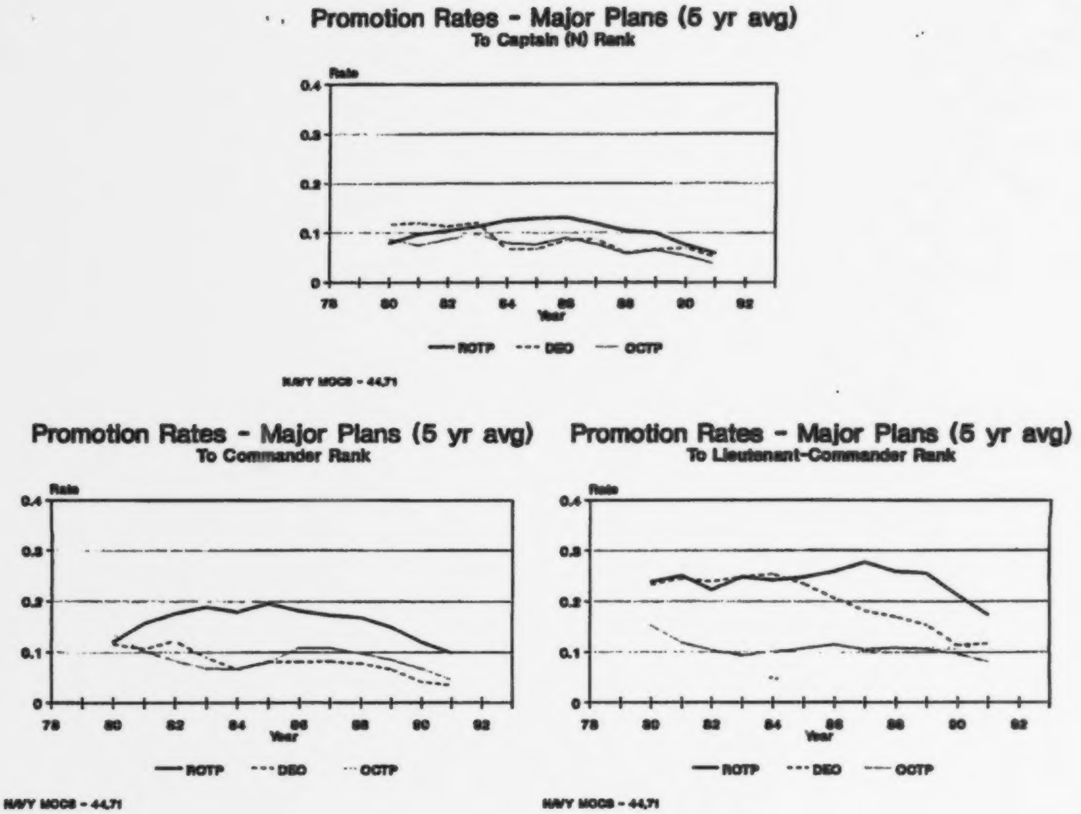


Figure B - 5: Promotion Rates - Major Plans
5-year Moving Averages
Naval MOCs

7. ROTP - CMC/Civilian University The statistical tests on differences in ROTP promotion rates for naval officers from CMC or from civilian universities were inconclusive (Figure B - 6). The recent decline in rates apparent at all ranks is possibly related to the FRP.

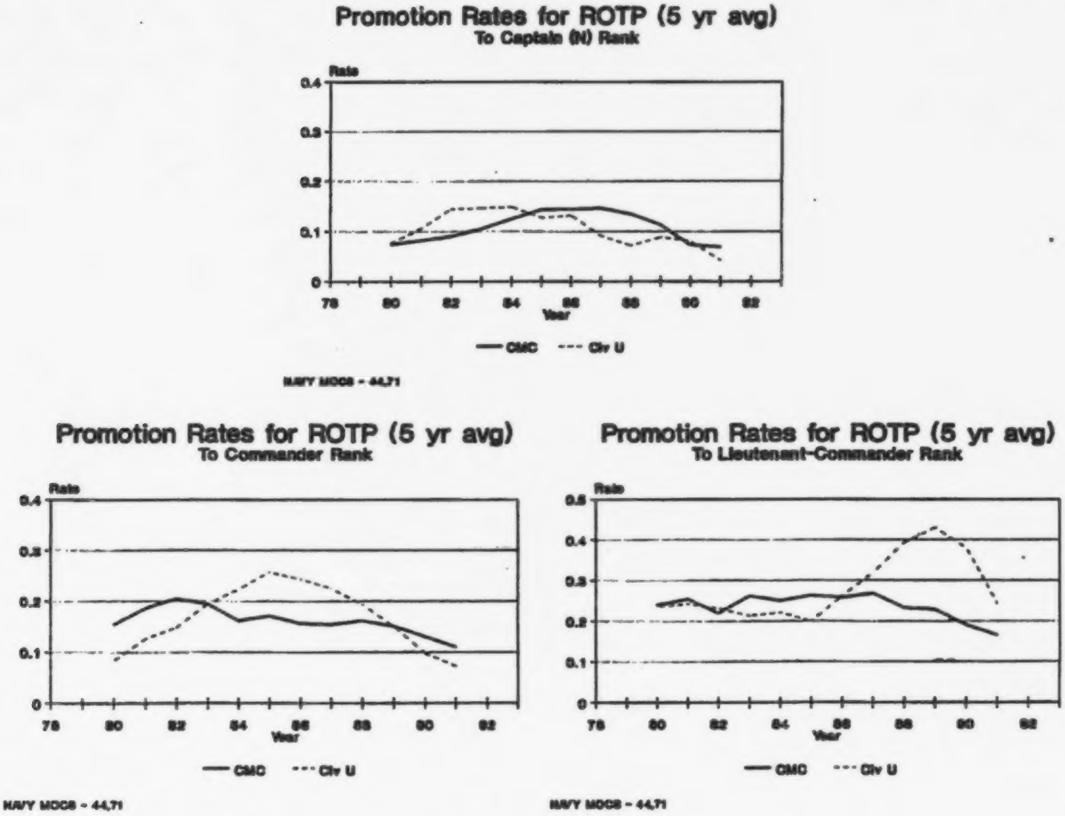
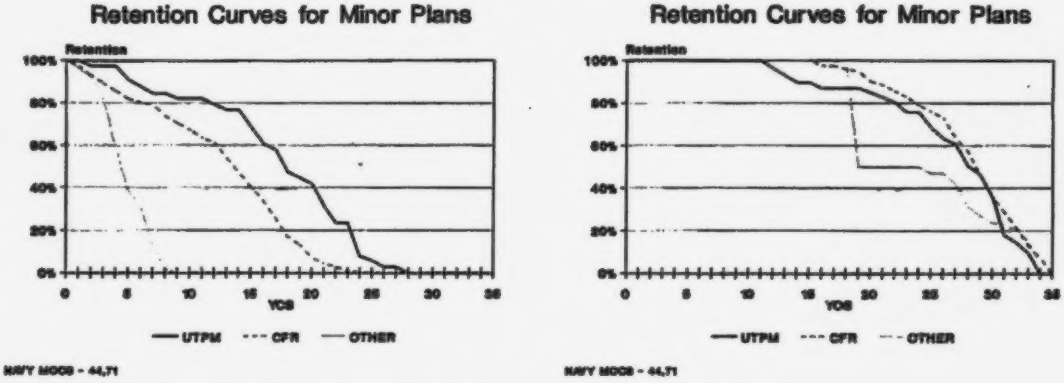


Figure B - 6: ROTP Promotion Rates
5-year Moving Averages
Naval MOCs

Retention

8. **Minor Plans** The minor plan retention curves reveal that the average length of service was 16.4 YCS (25.9 YOS) for naval officers commissioned under UTPM, 11.9 YCS (27.4 YOS) for CFR officers, and 4.2 YCS (23.8 YOS) for 'other' plans (Figure B - 7).

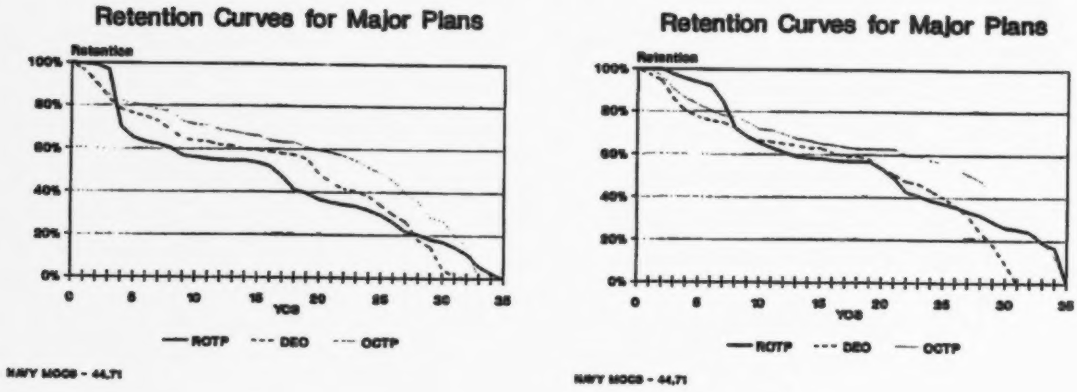


NAVY MOCS - 44,71

NAVY MOCS - 44,71

Figure B - 7: Minor Plan Retention Curves
Naval MOCs

9. Major Plans ROTP obligatory service of three years is apparent in the YCS plot, but ROTP officer attrition slowed at five YCS to level near 57 percent at the start of the IE (**Figure B - 8**). YCS differences were significant throughout for ROTP/OCTP, and for the first seven years for ROTP/DEO. Officer retention at the start of the IE was about 71 percent for OCTP and about 64 percent for DEO. In the YOS plot naval officers from all three plans experienced increased attrition near the start of the IPS, and the ROTP/OCTP curves were significantly different thereafter. ROTP attrition was the greatest until it began to level at 22 YOS; DEO attrition continued to increase. The average length of service was 15.2 YCS (19.0 YOS) for ROTP officers, 16.5 YCS (17.5 YOS) for DEO officers, and 19.5 YCS (21.0 YOS) for OCTP officers.

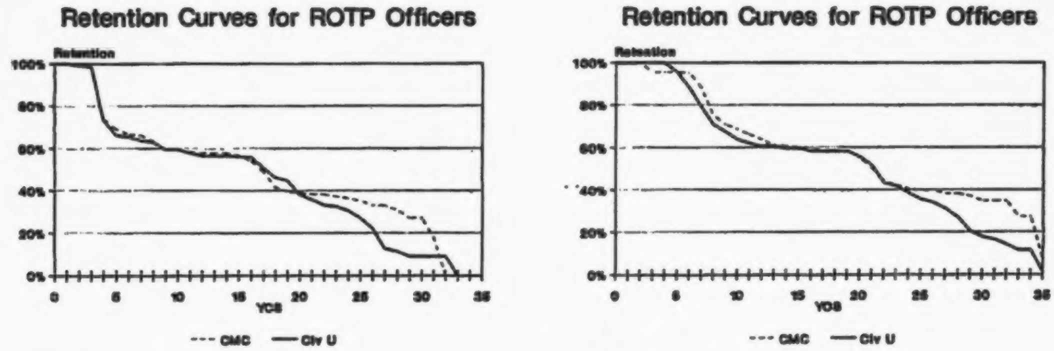


Retention Curves for Major Plans

Retention Curves for Major Plans

Figure B - 8: Major Plan Retention Curves
Naval MOCs

10. ROTP - CMC/Civilian University The YCS retention curves for naval ROTP officers were similar for the first 15 YCS, and the CMC curve was smoother since larger numbers were involved (Figure B - 9). Few naval officers took advantage of the gratuity offered at nine YCS, and about 60 percent of CMC and civilian university naval officers remained at 20 YOS. The average length of service was 16.2 YCS (20.2 YOS) for naval ROTP officers from CMC and 15.1 YCS (18.5 YOS) for ROTP officers from civilian universities.



NAVY MOCS - 44,71

NAVY MOCS - 44,71

Figure B - 9: ROTP Retention Curves
Naval MOCs

11. **Civilian University - ROTP/DEOD** Of naval officers that attended civilian universities, DEOD attrition started earlier than that for ROTP, but ROTP officer retention levelled at five YCS in response to the gratuity offered at the end of the SE (**Figure B - 10**). Nearly 62 percent of DEOD and 60 percent of ROTP officers remained to 20 YOS. DEOD naval officer attrition was higher during the IPS, but numbers were too small to conduct statistical tests. The average length of service was 15.1 YCS (18.5 YOS) for civilian university ROTP officers; for DEOD officers it was 17.0 YCS (17.4 YOS).

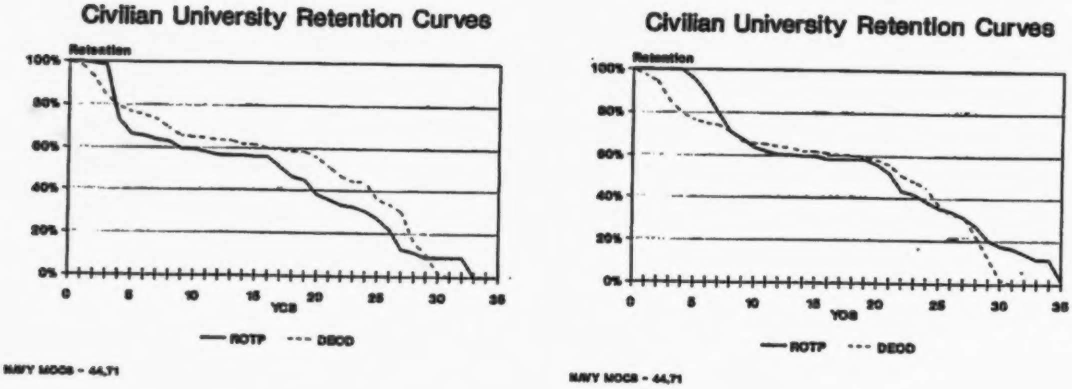


**Figure B - 10: Civilian University Retention Curves
Naval MOCs**

COMBAT ARMS OCCUPATIONS

Strength

1. The combat arms grew by 36 percent in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in **Figure C - 1**, were:

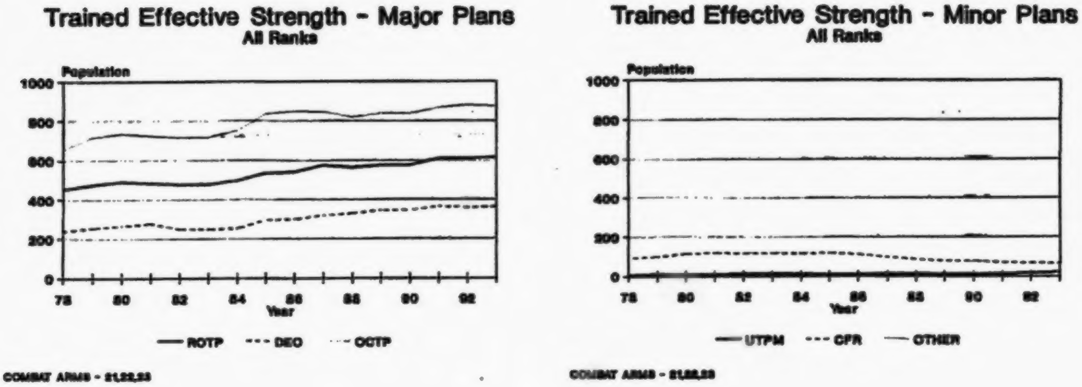


**Figure C - 1: Trained Effective Strength
All Commissioning Plans - Combat Arms
Ranks Lt to Col**

a. ROTP - a gradual increase of 36 percent over the period;

b. DEO - an increase of 51 percent, most of it since 1984;

c. OCTP - an increase of 34 percent over the period;

d. UTPM - a significant percentage increase due to small numbers;

e. CFR - a decrease of 30 percent in the period since 1986; and

f. other plans - commissioning through these plans was only introduced to combat arms in 1979.

Commissioning Plan Distribution

2. Despite changes in the composition of the combat arms, commissioning plan distributions in the period from 1978 to 1993 were quite stable, as described below:

a. for all officers:
   (1) ROTP - a proportion of 31 percent in 1978 increased to 32 percent by 1993,
   (2) DEO - a proportion of 17 percent in 1978 increased to 19 percent by 1993,
   (3) OCTP - a proportion of 45 percent in both 1978 and 1993, and
   (4) minor plans combined - a proportion of seven percent in 1978 decreased to five percent by 1993;

b. for junior officers:
   (1) ROTP - a proportion of 30 percent in 1978 decreased to 29 percent by 1993,
   (2) DEO - a proportion of 13 percent in 1978 increased to 19 percent by 1993,
   (3) OCTP - a proportion of 47 percent in both 1978 and 1993, and
   (4) minor plans combined - a proportion of ten percent in 1978 decreased to six percent by 1993; and

c. for senior officers there were more variations in the distributions over time:
   (1) ROTP - a proportion of 31 percent in 1978 increased to 36 percent by 1993, having been as high as 40 percent in 1986,

(2) DEO - a proportion of 25 percent in 1978 increased to 18 percent by 1993, although in 1986 it had been as low as 13 percent,

(3) OCTP - a proportion of 42 percent from 1978 to 1993, and

(4) minor plans combined - one percent proportion in 1978 increased to four percent by 1993.

ROTP - CMC/Civilian University

3. ROTP numbers in combat arms increased by 36 percent. The CMC component increased by 62 percent, while civilian university ROTP graduates decreased by 15 percent (**Figure C - 2**). Between 1978 and 1993 CMC graduates went from representing 62 to 73 percent of ROTP combat arms officers; civilian university ROTP graduates decreased their representation from 37[1] to 23[1] percent of ROTP officers.

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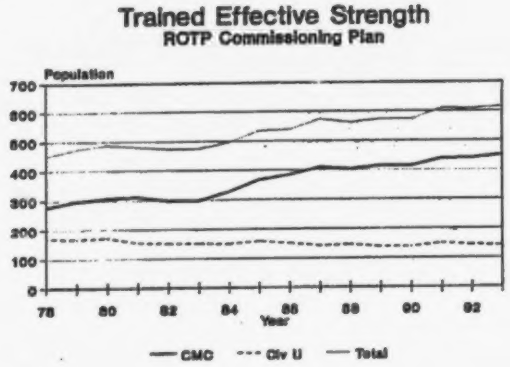
[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

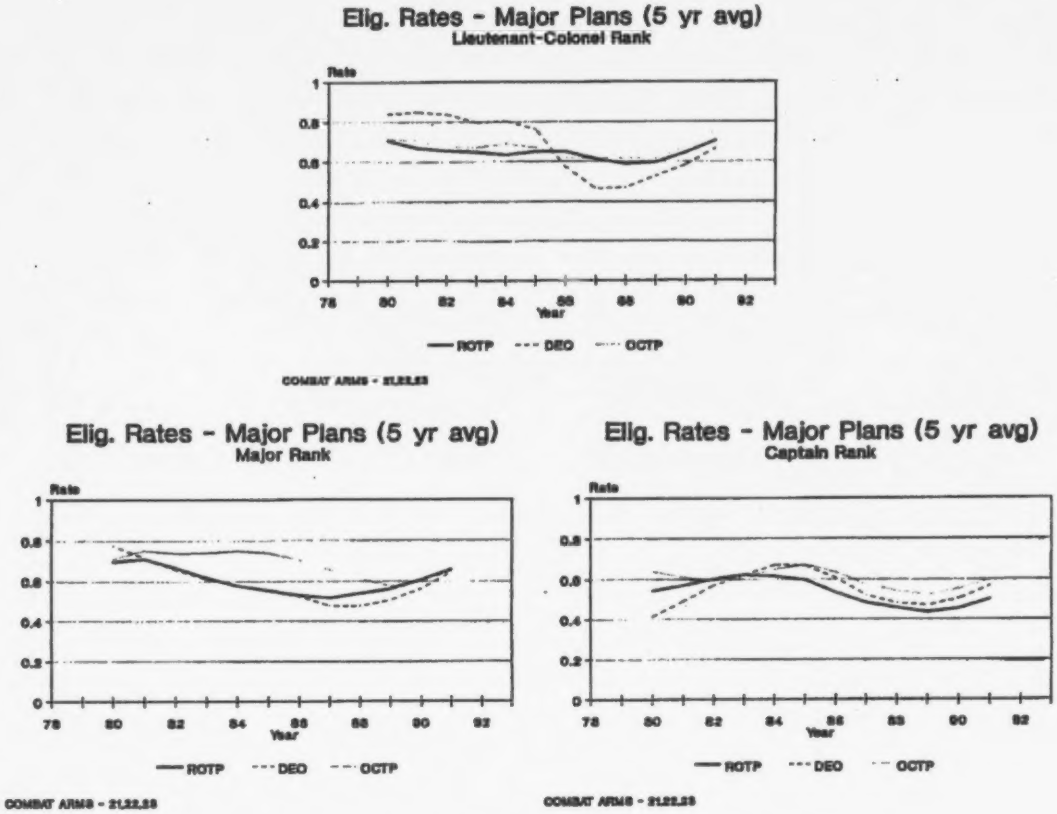


COMBAT ARMS - 21,22,23

Figure C - 2: Trained Effective Strength
ROTP - Combat Arms
Ranks - Lt to Col

Eligibility Rates

4. **Major Plans** The eligibility rates for OCTP combat arms officers at the Capt and Maj ranks have generally been the highest (**Figure C - 3**). Most recently the ROTP eligibility rate at the Capt rank has been the lowest, while at the Maj rank DEO eligibility has been lowest. The ROTP and OCTP eligibility rates for LCols have been very close while the DEO numbers were too small to interpret. Eligibility rates for all plans have increased since the 1990 FRP was introduced.


Elig. Rates - Major Plans (5 yr avg)
Lieutenant-Colonel Rank

COMBAT ARMS - 21,22,23

Elig. Rates - Major Plans (5 yr avg)
Major Rank

COMBAT ARMS - 21,22,23

Elig. Rates - Major Plans (5 yr avg)
Captain Rank

COMBAT ARMS - 21,22,23

Figure C - 3: Eligibility Rates - Major Plans
5-year Moving Averages
Combat Arms

5. ROTP - CMC/Civilian University Eligibility rates for CMC graduates have been consistently lower at all three ranks (**Figure C - 4**). Except for combat arms Capts from civilian universities, eligibility rates for ROTP officers from both sources have increased since the FRP introduction produced a drop in the number of promotions.

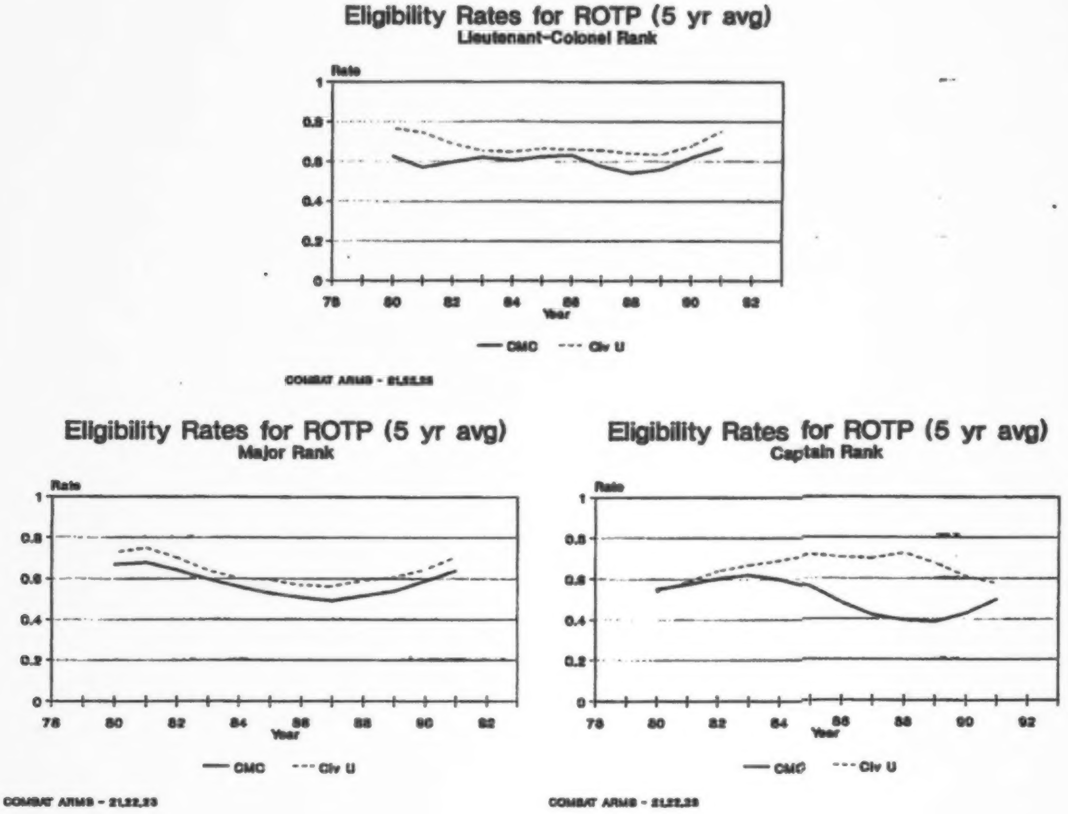


Figure C - 4: ROTP Eligibility Rates
5-year Moving Averages
Combat Arms

Promotion Rates

6. **Major Plans** ROTP rates of promotion to the Maj rank have been significantly[2] higher than those for OCTP and DEO officers. ROTP rates of promotion to the LCol rank have been significantly higher than those for OCTP officers (**Figure C - 5**). Over the last few years a drop in rates at all rank levels is conceivably related to the FRP.

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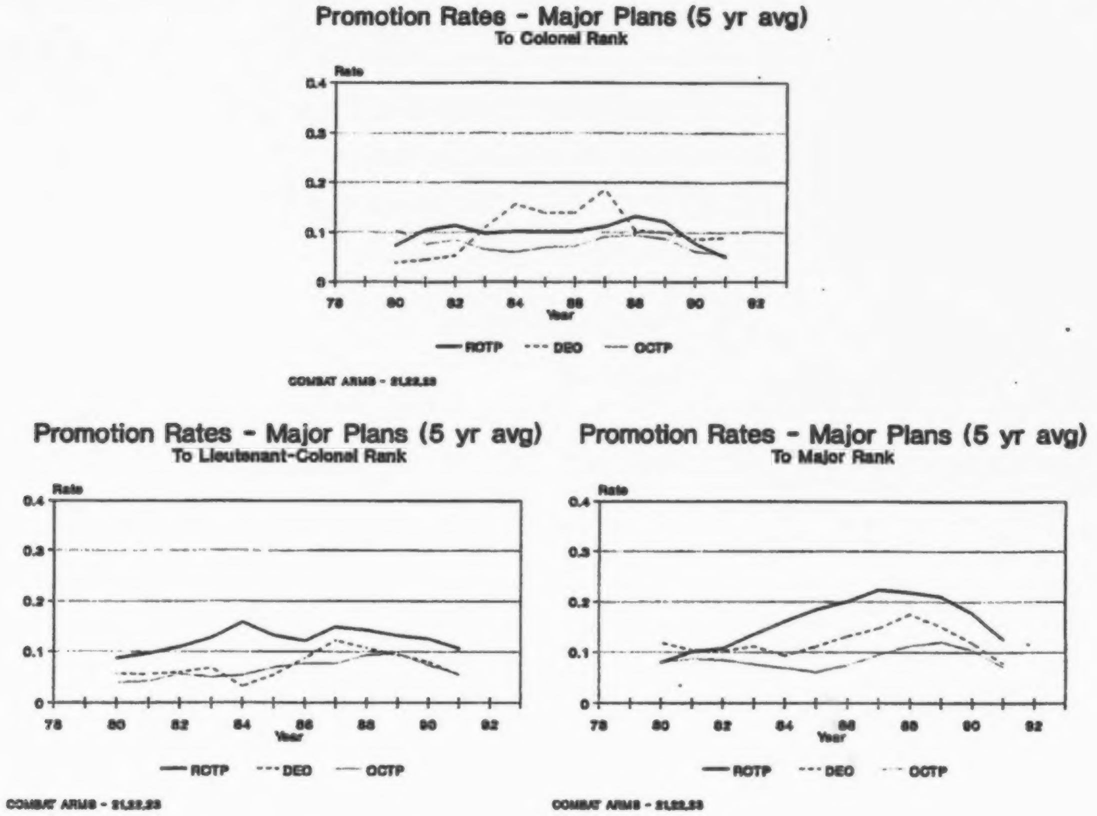
[2] All statements on statistical significance are tested at the 95 percent confidence level.


Promotion Rates - Major Plans (5 yr avg)
To Colonel Rank

Promotion Rates - Major Plans (5 yr avg)
To Lieutenant-Colonel Rank

Promotion Rates - Major Plans (5 yr avg)
To Major Rank

Figure C - 5: Promotion Rates - Major Plans
5-year Moving Averages
Combat Arms

7. ROTP - CMC/Civilian University Combat arms promotion rates to the Maj and Col ranks have been higher for CMC officers (**Figure C - 6**). On the other hand the rate of promotion to the LCol rank was higher for officers from civilian universities. A recent decline in rates apparent at all ranks is presumably related to the FRP.

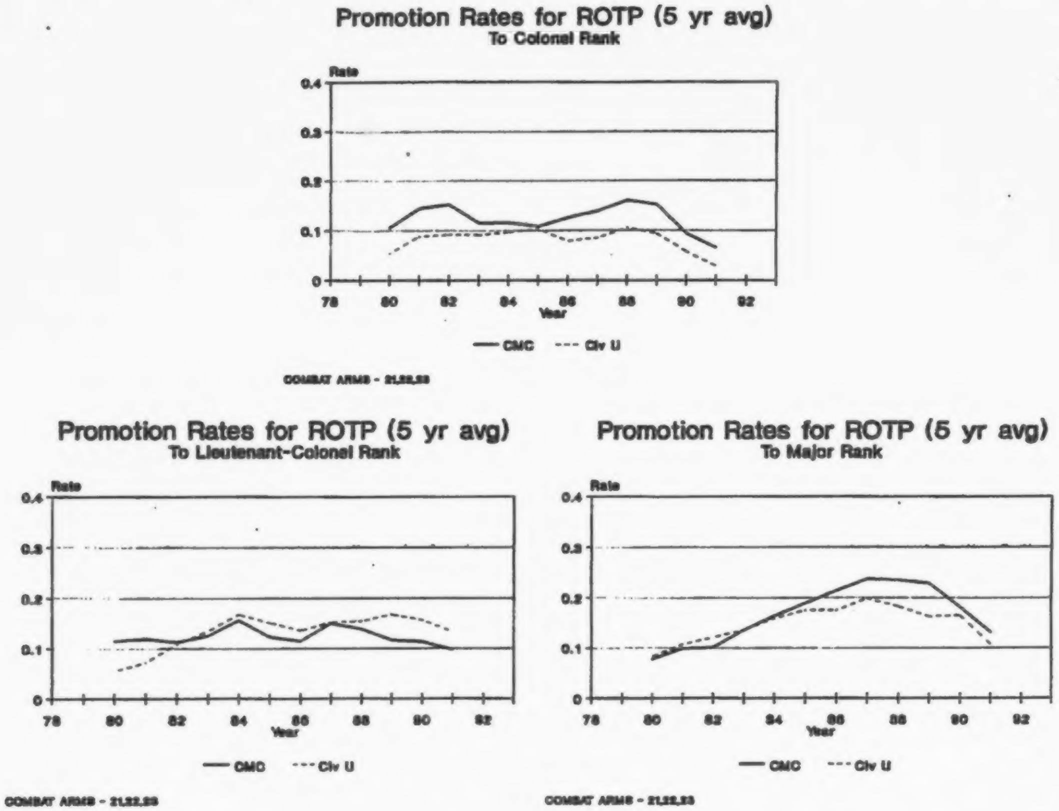


Figure C - 6: ROTP Promotion Rates
5-year Moving Averages
Combat Arms

Retention

8. **Minor Plans** The combat arms retention curves reveal little since so few officers were involved. The average length of service was 9.3 YCS (29.9 YOS) for CFR officers (**Figure C - 7**).

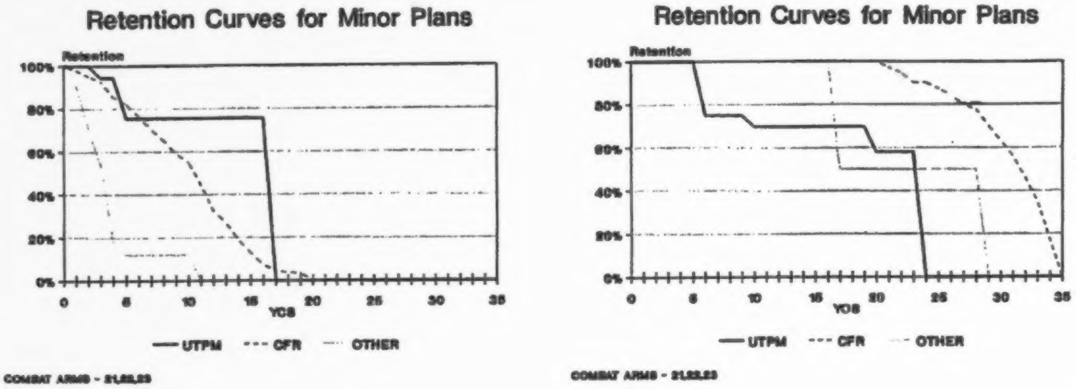


**Figure C - 7: Minor Plan Retention Curves
Combat Arms**

9. **Major Plans** The ROTP obligatory service of three years is apparent in the YCS plot in **Figure C - 8.** ROTP officer retention levelled off near 67 percent at the start of the IE, being significantly different than that for DEO or OCTP up to that point. Similar DEO and OCTP attrition rates were lower initially--DEO retention levelled at about 73 percent at the start of the IE and OCTP at about 71 percent. The statistical tests on differences in the YOS curves were inconclusive, however all three plans show an increase in attrition at the start of the IPS. The average length of service was 18.2 YCS (21.8 YOS) for ROTP officers, 19.4 YCS (20.4 YOS) for DEO officers, and 20.4 YCS (21.7 YOS) for OCTP officers.

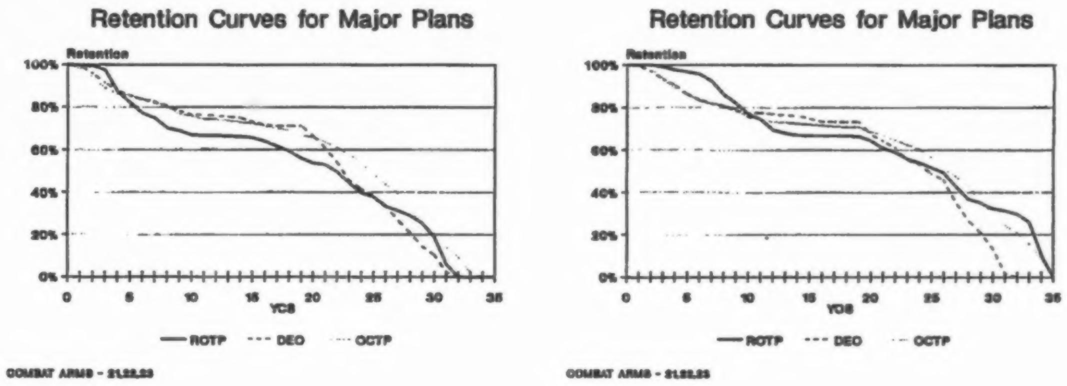
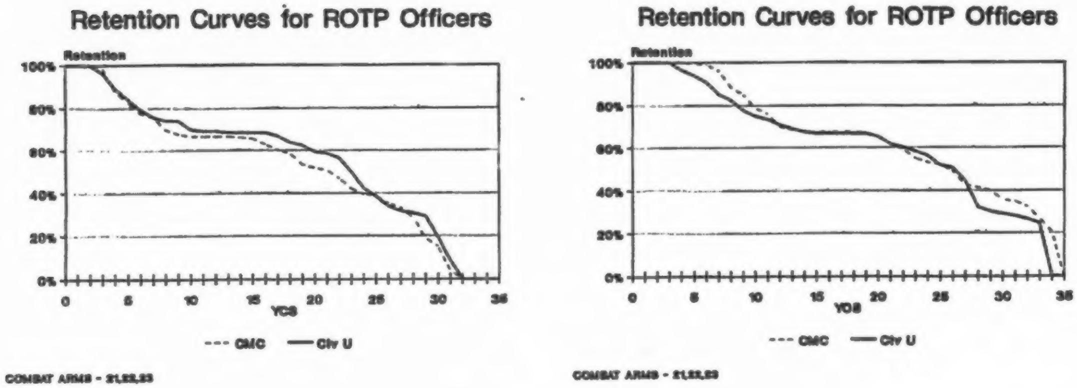


Figure C - 8: Major Plan Retention Curves
Combat Arms

10. ROTP - CMC/Civilian University The combat arms retention curves for ROTP officers are similar (**Figure C - 9**). CMC attrition continued to nine YCS, whereas attrition of officers from a civilian university background levelled off between seven and nine YCS, possibly to take advantage of the gratuity offered then. The YOS curves indicate that officers from civilian universities left earlier than did CMC officers, and about 67 percent remained until the end of the IE. The average length of service was 17.9 YCS (22.4 YOS) for ROTP combat arms officers from CMC, and 19.1 YCS (21.4 YOS) for ROTP officers from civilian universities.


Retention Curves for ROTP Officers

Retention Curves for ROTP Officers

COMBAT ARMS - 21,22,23

COMBAT ARMS - 21,22,23

Figure C - 9: ROTP Retention Curves
Combat Arms

11. Civilian University - ROTP/DEOD Of those combat arms officers that attended civilian universities, DEOD show earlier attrition than did ROTP, and only ROTP officers showed a response to the nine YCS gratuity offered at the end of the SE (**Figure C - 10**). Statistical tests on retention were inconclusive. The average length of service was 18.8 YCS (19.3 YOS) for DEOD combat arms officers and 19.1 YCS (21.4 YOS) for ROTP officers from civilian universities.

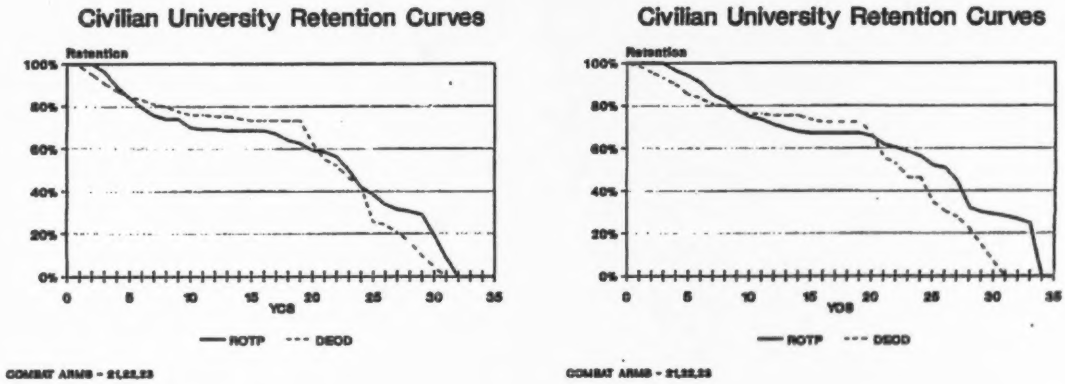
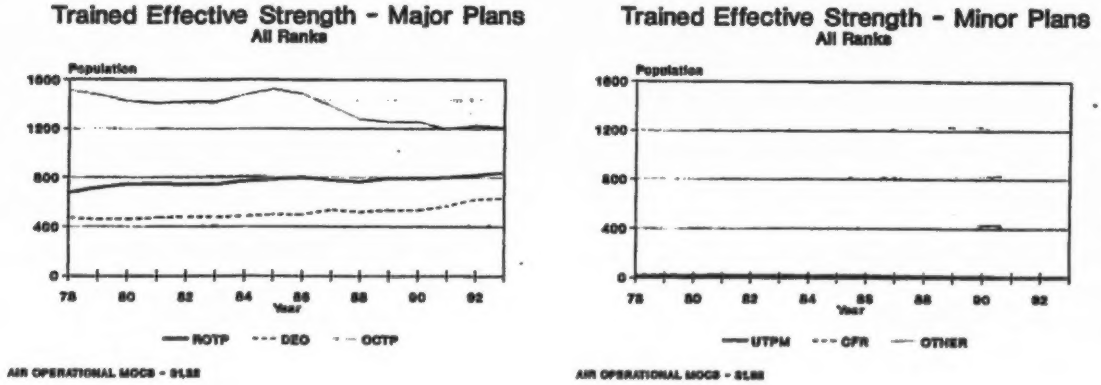


Figure C - 10: Civilian University Retention Curves
Combat Arms

AIR OPERATIONS OCCUPATIONS

Strength

1. The population in air operations (air ops) MOCs remained unchanged in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in **Figure D - 1**, were:



Trained Effective Strength - Major Plans
All Ranks

Trained Effective Strength - Minor Plans
All Ranks

AIR OPERATIONAL MOCS - 91,92

AIR OPERATIONAL MOCS - 91,92

Figure D - 1: Trained Effective Strength
All Commissioning Plans - Air Operations MOCs
Ranks - Lt to Col

a. ROTP - a gradual increase of 25 percent over the period;

b. DEO - an increase of 34 percent, also continuous over the period;

c. OCTP - a decrease of 20 percent over the period, despite an increase between 1983 and 1985;

d. UTPM - a decrease, mainly since 1986, of 31 percent over the period;

e. CFR - a decrease of 88 percent from 1978 to 1993; and

f. other plans - an increase of 300 percent (from one to four officers).

Commissioning Plan Distribution

2. Because there were changes in the composition of the air ops MOCs as a whole, commissioning plan distributions in the period from 1978 to 1993 were also examined and showed:

a. for all officers:

(1) ROTP - a proportion of 25 percent in 1978 increased smoothly to 31 percent by 1993,

(2) DEO - a proportion of 17 percent in 1978 increased to 23 percent by 1993,

(3) OCTP - a proportion of 56 percent in 1978 decreased to 45 percent by 1993, and

(4) minor plans combined - a proportion of two percent in 1978 decreased to one percent by 1993;

b. for junior officers:

(1) ROTP - a proportion of 27 percent in 1978 decreased to 26 percent by 1993, but varied from as low as 23 percent to as high as 30 percent over the period,

(2) DEO - a proportion of 17 percent in 1978 increased steadily to 26 percent by 1993,

(3) OCTP - a proportion of 55 percent in 1978 decreased to 47 percent by 1993, after having reached 56 percent in 1985, and

(4) minor plans combined - a proportion of less than two percent in 1978 decreased to one percent by 1993; and

c. for senior officers:

(1) ROTP - a proportion of 22 percent in 1978 almost doubled at the expense of OCTP to 42 percent by 1993,

(2) DEO - a proportion of 18 percent in 1978 and 1993, having fluctuated over the period,

(3) OCTP - a proportion of 59 percent in 1978 decreased to 39 percent by 1993, and

(4) minor plans combined - remained at a proportion of one percent.

ROTP - CMC/Civilian University

3. ROTP numbers in air ops increased by 25 percent. Whereas the CMC component actually increased by 52 percent, civilian university ROTP graduates decreased by 26 percent (**Figure D - 2**). Between 1978 and 1993, CMC graduates went from representing 60 to 72 percent of ROTP air ops officers; civilian university ROTP graduates decreased their representation from 40 to 24[1] percent.

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[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

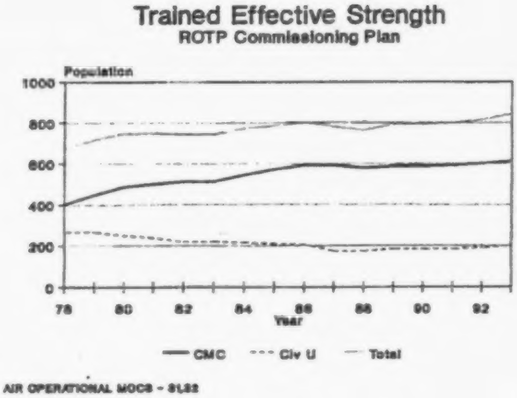
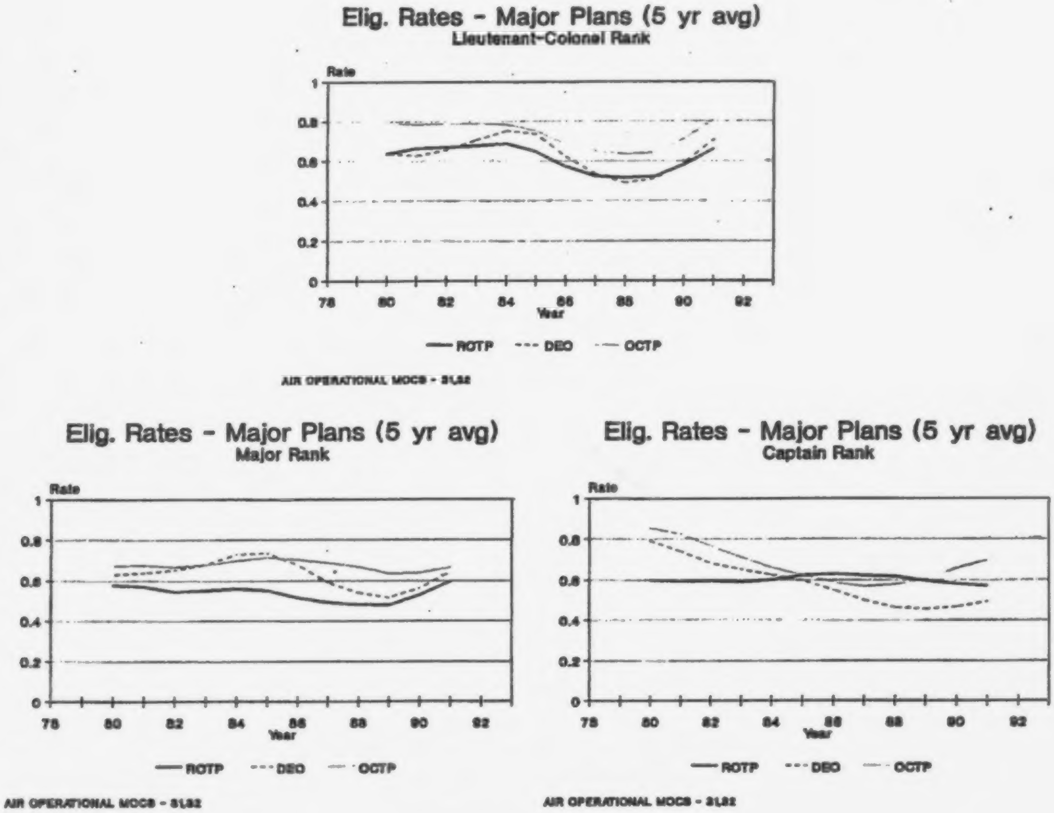


Figure D - 2: Trained Effective Strength
ROTP - Air Operations MOCs
Ranks - Lt to Col

Eligibility Rates

4. **Major Plans** In air ops eligibility rates for OCTP officers have been generally higher than for ROTP or DEO officers (**Figure D - 3**). Conversely, ROTP eligibility rates have often been the lowest. The ROTP eligibility rate at the Capt rank has been relatively constant while those for the other two have been decreasing. In general, eligibility rates at all ranks and for all plans have increased since the 1990 FRP was introduced.



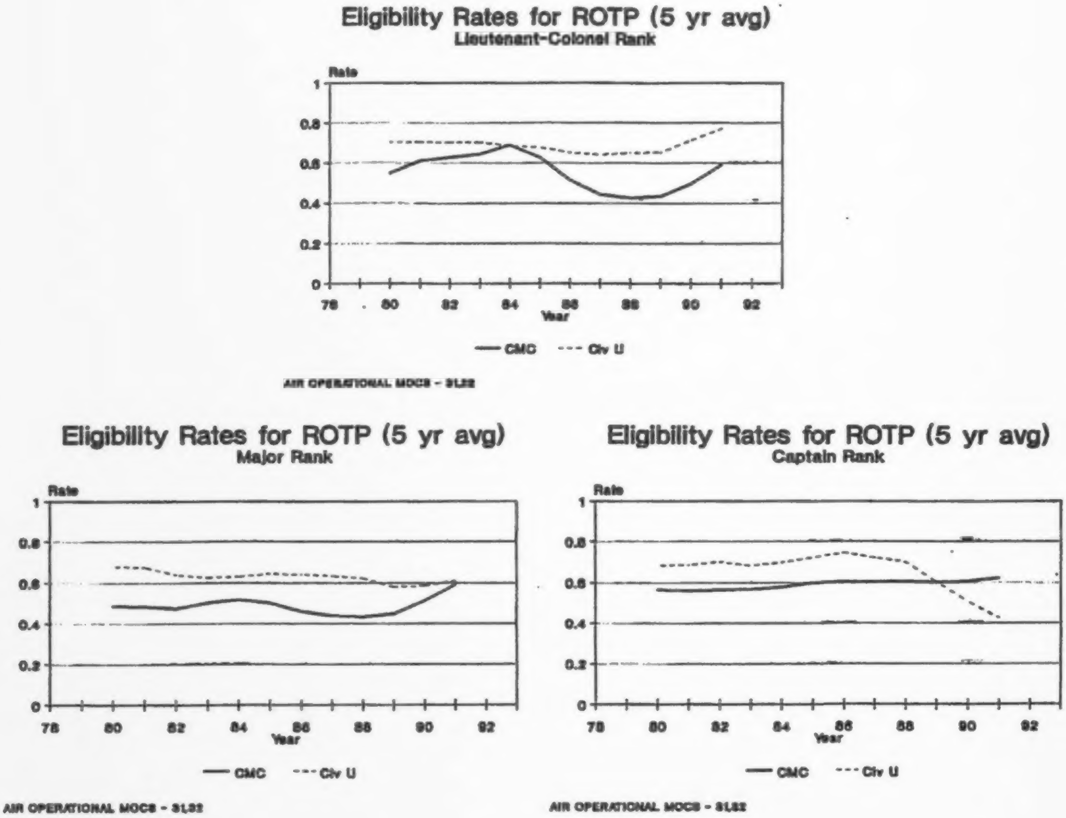
Elig. Rates - Major Plans (5 yr avg)
Lieutenant-Colonel Rank

Elig. Rates - Major Plans (5 yr avg)
Major Rank

Elig. Rates - Major Plans (5 yr avg)
Captain Rank

Figure D - 3: Eligibility Rates - Major Plans
5-year Moving Averages
Air Operations MOCs

5. ROTP - CMC/Civilian University Eligibility rates for CMC graduates have generally been lower at all three ranks (**Figure D - 4**). The FRP introduction in 1990 has increased eligibility rates for all ROTP officers at the Maj and LCol ranks.



AIR OPERATIONAL MOCS - 9L92

AIR OPERATIONAL MOCS - 9L92

AIR OPERATIONAL MOCS - 9L92

**Figure D - 4: ROTP Eligibility Rates
5-year Moving Averages
Air Operations MOCs**

Promotion Rates

6. **Major Plans** ROTP promotion rates to all senior ranks in air ops have been significantly[2] higher than those for DEO and OCTP officers (**Figure D - 5**). The DEO promotion rates to the Maj rank were significantly higher than those for OCTP officers. A drop in rates at all rank levels over the last few years is probably related to the 1990 FRP.

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[2] All statements on statistical significance are tested at the 95 percent confidence level.

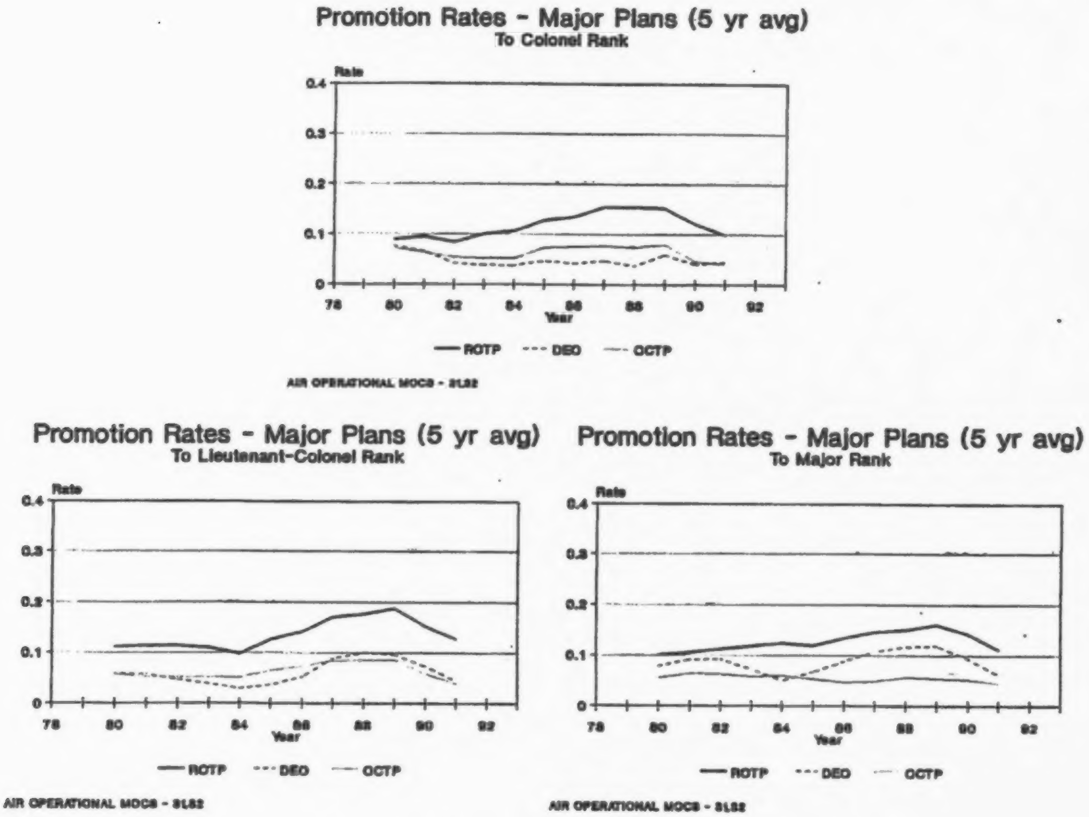
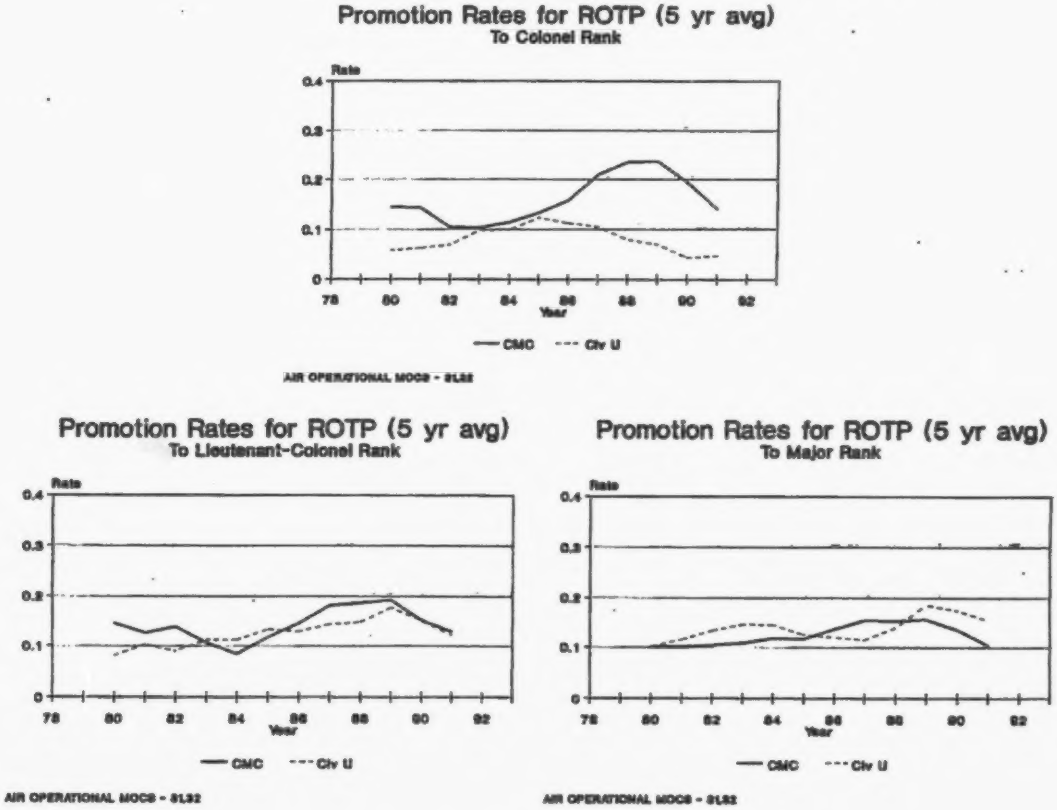


Figure D - 5: Promotion Rates - Major Plans
5-year Moving Averages
Air Operations MOCs

7. ROTP - CMC/Civilian University In comparing ROTP promotion rates, CMC rates were significantly higher only to the Col rank (**Figure D - 6**). The FRP influence is apparent in a recent decline in the rates for all ranks.


Promotion Rates for ROTP (5 yr avg)
To Colonel Rank

AIR OPERATIONAL MOCS - 31,32

Promotion Rates for ROTP (5 yr avg)
To Lieutenant-Colonel Rank

AIR OPERATIONAL MOCS - 31,32

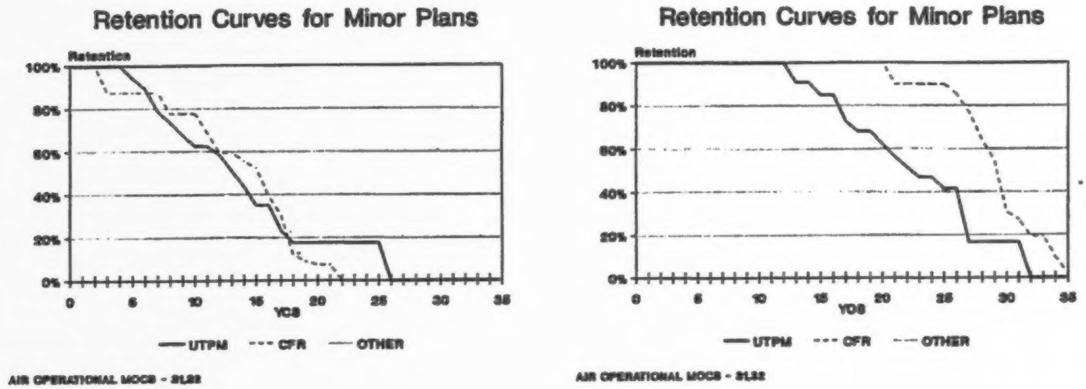
Promotion Rates for ROTP (5 yr avg)
To Major Rank

AIR OPERATIONAL MOCS - 31,32

Figure D - 6: ROTP Promotion Rates
5-year Moving Averages
Air Operations MOCs

Retention

8. **Minor Plans** The retention curves reveal little about officers commissioned into air ops through the minor plans since so few officers were involved (Figure D - 7).



Retention Curves for Minor Plans

AIR OPERATIONAL MOCS - 31L22

Retention Curves for Minor Plans

AIR OPERATIONAL MOCS - 31L32

Figure D - 7: Minor Plan Retention Curves
Air Operations MOCs

9. Major Plans ROTP officer retention was significantly higher since ROTP obligatory service delayed the start of attrition in the YCS plot (Figure D - 8). Significant YOS differences were also present at the end of the IE, where ROTP retention was 66 percent, OCTP 55 percent and DEO 50 percent. The average length of service was 17.8 YCS (21.2 YOS) for ROTP officers, 14.1 YCS (15.8 YOS) for DEO officers, and 16.7 YCS (18.1 YOS) for OCTP officers.

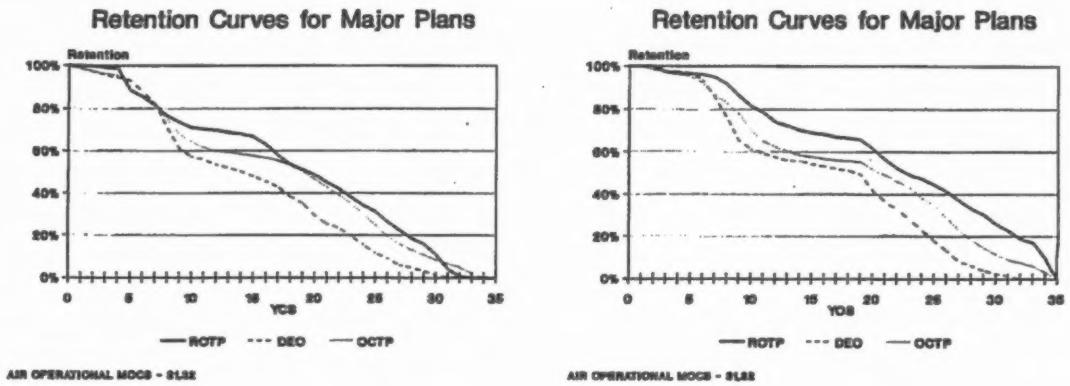


**Figure D - 8: Major Plan Retention Curves
Air Operations MOCs**

10. ROTP - CMC/Civilian University Following similar retention during ROTP obligatory service, attrition of CMC officers in air ops was gradual to nine YCS, while retention of officers from a civilian university background was significantly different (**Figure D - 9**). About 72 percent of CMC and 56 percent of civilian university officers served to the end of the IE. Within the air ops MOCs the average length of service of ROTP officers was 18.2 YCS (22.5 YOS) for those from CMC and 16.2 YCS (19.3 YOS) for those from civilian universities.

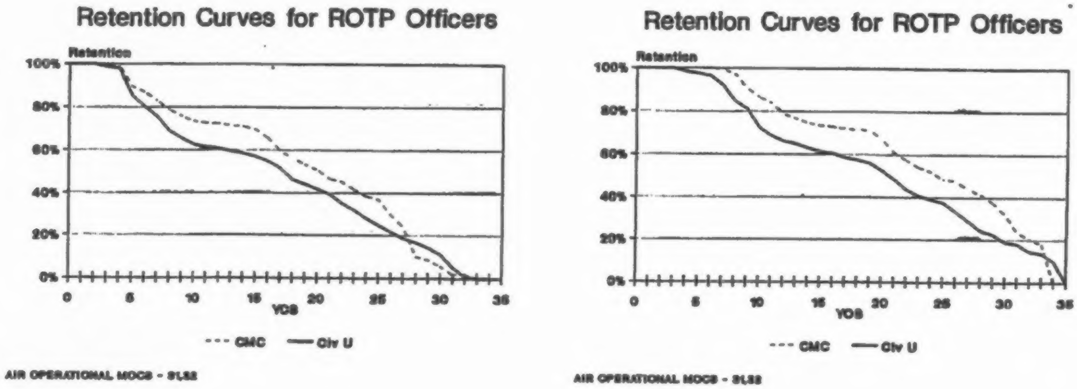
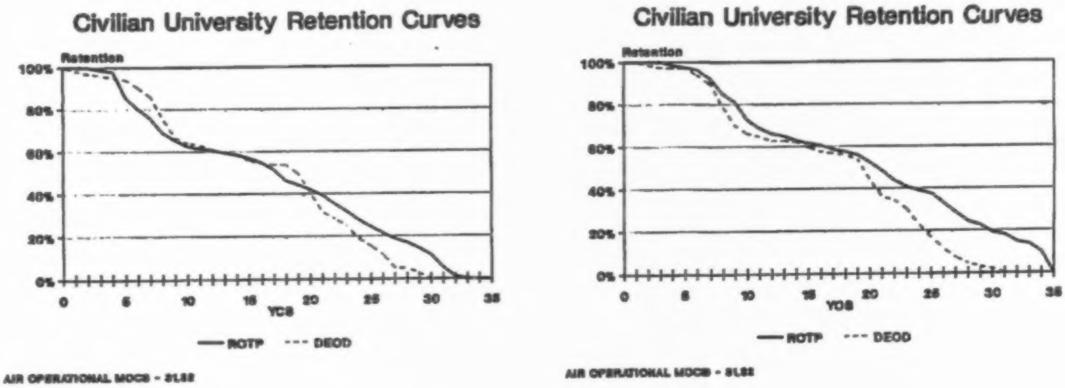


**Figure D - 9: ROTP Retention Curves
Air Operations MOCs**

11. Civilian University - ROTP/DEOD Of those air operations officers that attended civilian universities, DEOD showed earlier attrition than did ROTP, so retention was significantly different between seven and 14 YCS (**Figure D - 10**). YOS retention was also significantly different since DEOD attrition was highest during the IPS. Within air ops MOCs the average length of service of officers from civilian universities was 15.6 YCS (16.4 YOS) for those commissioned as DEOD and 16.2 YCS (19.3 YOS) for those commissioned as ROTP.


Civilian University Retention Curves

Civilian University Retention Curves

AIR OPERATIONAL MOCS - 31L82

AIR OPERATIONAL MOCS - 31L82

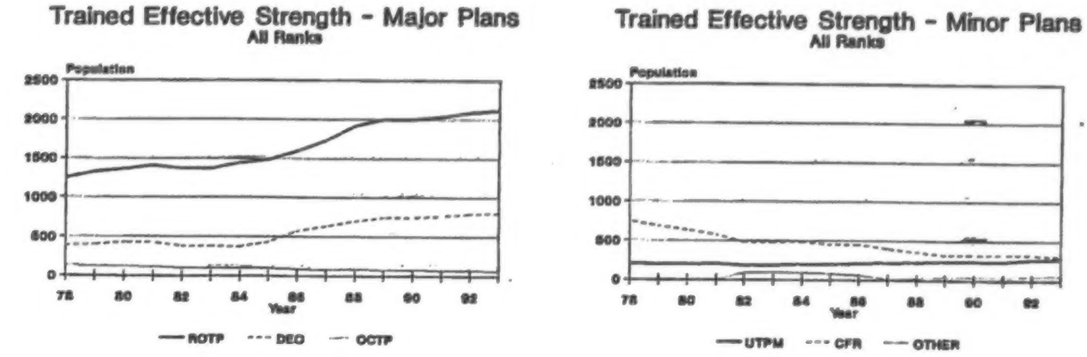
Figure D - 10: Civilian University Retention Curves
Air Operations MOCs

ANNEX E
TO D MAN A PR 649 - VOL II
DECEMBER 1993

ENGINEERING OCCUPATIONS

Strength

1. The engineering MOCs grew by 24 percent in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in **Figure E - 1**, were:



ENGINEERING MOCS - 41,42,43,44,46

ENGINEERING MOCS - 41,42,43,44,46

Figure E - 1: Trained Effective Strength
All Commissioning Plans - Engineering MOCs
Ranks - Lt to Col

a. ROTP - an increase of 70 percent, mostly since 1983;

b. DEO - an increase of 109 percent, mostly since 1984;

c. OCTP - a slow steady decrease of 40 percent over the period;

d. UTPM - an increase of 40 percent, mostly in the period from 1983 to 1993;

e. CFR - a decrease of 59 percent, primarily in the periods from 1978 to 1982 and 1986 to 1989; and

f. other plans - an infinite percentage increase due to small numbers, most of it in 1982.

Commissioning Plan Distribution

2. Because there were changes in the composition of the engineering MOCs, commissioning plan distributions in the period from 1978 to 1993 were also examined and showed:

a. for all officers:

  (1) ROTP - a proportion of 46 percent in 1978 increased smoothly to 59 percent by 1993,

  (2) DEO - a proportion of 14 percent in 1978 increased to 22 percent by 1993,

  (3) OCTP - a proportion of five percent in 1978 decreased to two percent by 1993, and

  (4) minor plans combined - a proportion of 35 percent in 1978 decreased to 17 percent by 1993;

b. for junior officers:

  (1) ROTP - a proportion of 45 percent in 1978 increased to 57 percent by 1993,

  (2) DEO - a proportion of 12 percent in 1978 increased to 24 percent by 1993,

  (3) OCTP - a proportion of three percent in 1978 decreased to one percent by 1993, and

  (4) minor plans combined - a proportion of 40 percent in 1978 decreased to 18 percent by 1993; and

c. for senior officers all changes in distributions occurred smoothly between 1978 and 1993:

  (1) ROTP - a proportion of 48 percent increased to 62 percent,

  (2) DEO - a proportion of 20 percent decreased to 19 percent,

(3) OCTP - a proportion of four percent decreased to three percent, and

(4) minor plans combined - a proportion of 27 percent decreased to 17 percent.

ROTP - CMC/Civilian University

3. ROTP numbers in the engineering MOCs increased by 70 percent, and most of the increase was through the CMC system. Whereas the CMC component increased by 116 percent, the civilian university ROTP component decreased by 17 percent (**Figure E - 2**). Between 1978 and 1993 CMC graduates went from representing 62 to 79 percent of ROTP engineering officers; civilian university ROTP graduates decreased their representation from 38 to 19[1] percent.

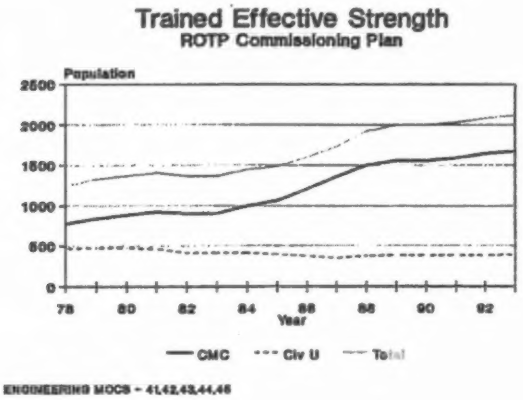


Figure E - 2: Trained Effective Strength
ROTP - Engineering MOCs
Ranks - Lt to Col

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[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

Eligibility Rates

4. **Major Plans** Engineering MOC eligibility rates for OCTP officers have been consistently higher than those for either DEO or ROTP officers (**Figure E - 3**). The ROTP and DEO eligibility rates at the Capt rank have been decreasing, those for DEO more so than for ROTP. Since 1986 the ROTP rate has been the lowest at the Maj rank, and the DEO eligibility rate has been the lowest at the LCol rank. Eligibility rates at all ranks and for all plans in the engineering MOCs have increased since the 1990 FRP was introduced.

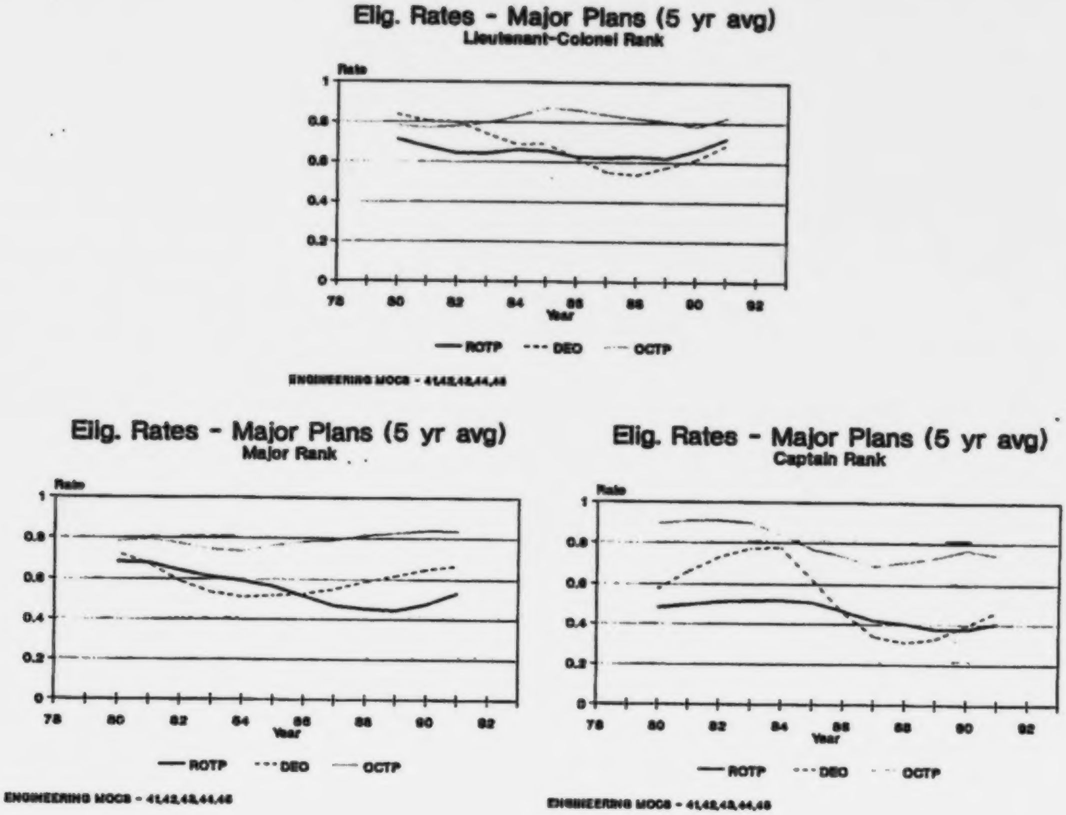

Figure E - 3: Eligibility Rates - Major Plans
5-year Moving Averages
Engineering MOCs

5. ROTP - CMC/Civilian University In comparing ROTP eligibility, the rates for CMC graduates in the engineering MOCs have been consistently lower at all three ranks, with a slight increase since 1989 (**Figure E - 4**).

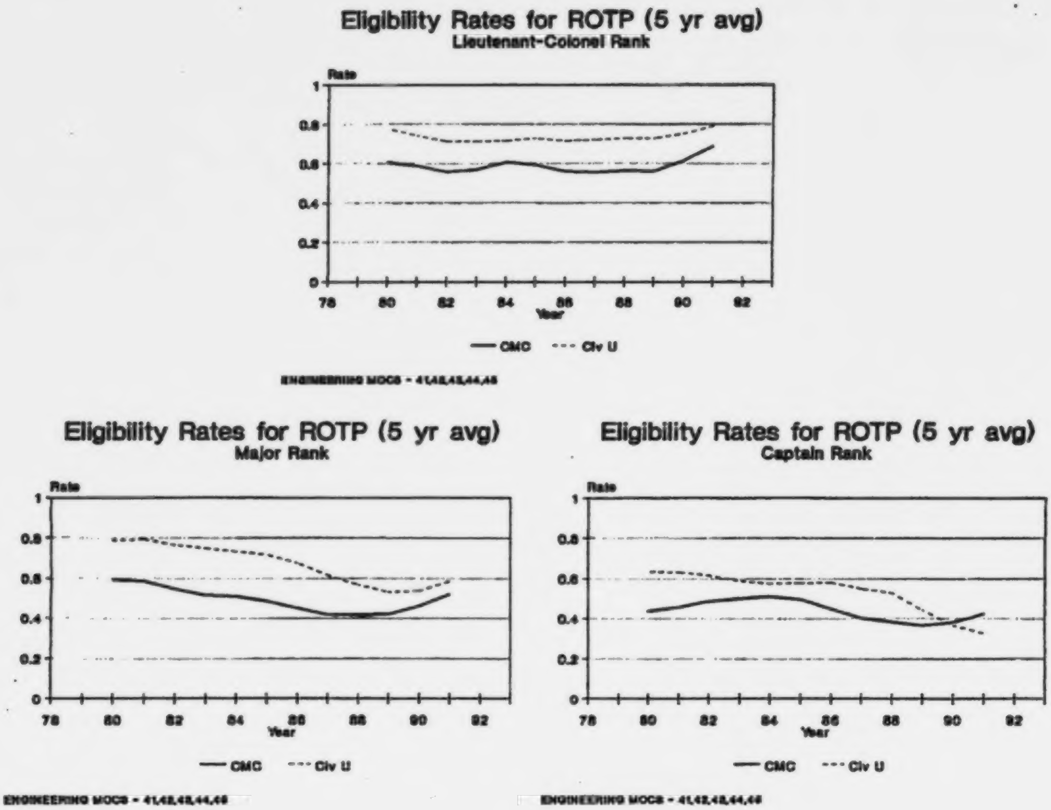

**Figure E - 4: ROTP Eligibility Rates
5-year Moving Averages
Engineering MOCs**

Promotion Rates

6. **Major Plans** ROTP promotion rates to the ranks of Maj and LCol were significantly[2] different from those for DEO and OCTP in the engineering MOCs (**Figure E - 5**). Despite apparent differences between DEO and OCTP promotion rates, especially promotion to the Maj rank, statistical tests on rates for these two plans were inconclusive at all ranks. The FRP influenced promotion rates to the Maj rank for both ROTP and DEO officers, but only influenced rates for ROTP officers to the LCol and Col ranks.

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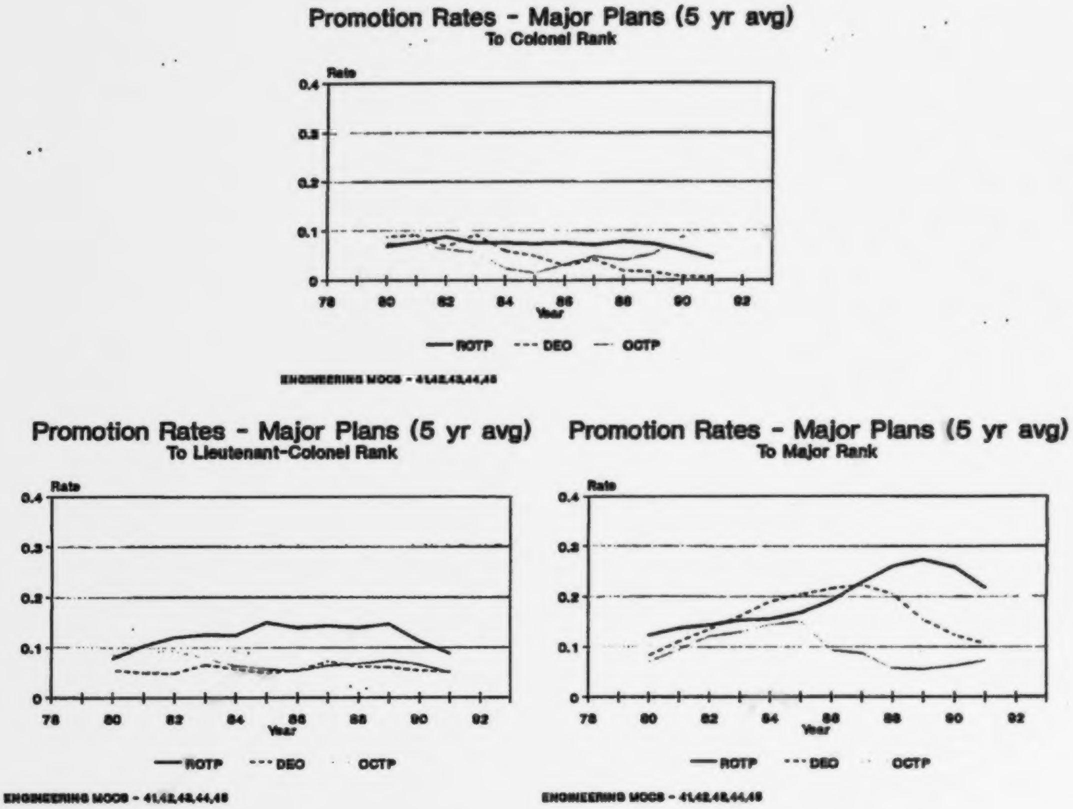
[2] All statements on statistical significance are tested at the 95 percent confidence level.



ENGINEERING MOCS - 41,42,43,44,48

ENGINEERING MOCS - 41,42,43,44,48

ENGINEERING MOCS - 41,42,43,44,48

Figure E - 5: Promotion Rates - Major Plans
5-year Moving Averages
Engineering MOCs

7. ROTP - CMC/Civilian University In comparing ROTP promotion rates, those for CMC were generally higher, except at the Maj rank since 1988 (**Figure E - 6**). FRP influences are apparent at all ranks.

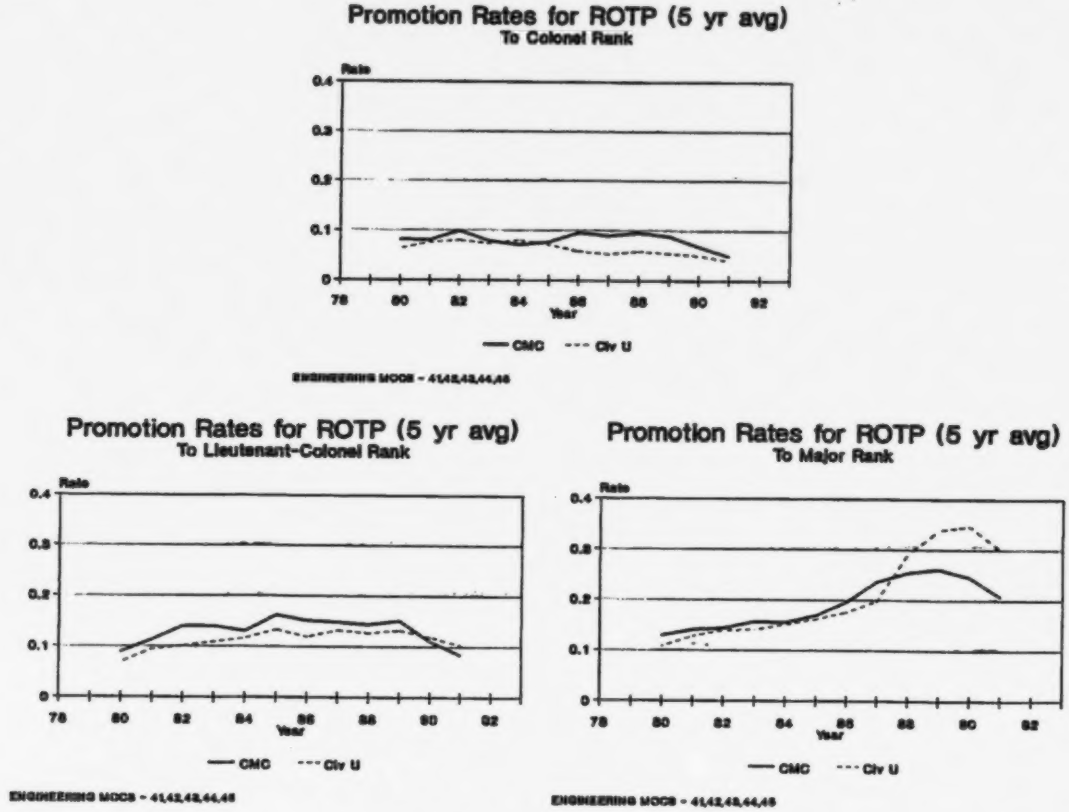


Figure E - 6: ROTP Promotion Rates
5-year Moving Averages
Engineering MOCs

Retention

8. **Minor Plans** The retention curves reveal that the average length of service for engineering officers was 13.2 YCS (24.2 YOS) for UTPM, 10.6 YCS (27.6 YOS) for CFR, and 2.8 YCS (27.0 YOS) for those commissioned under the 'other' plans (Figure E - 7).

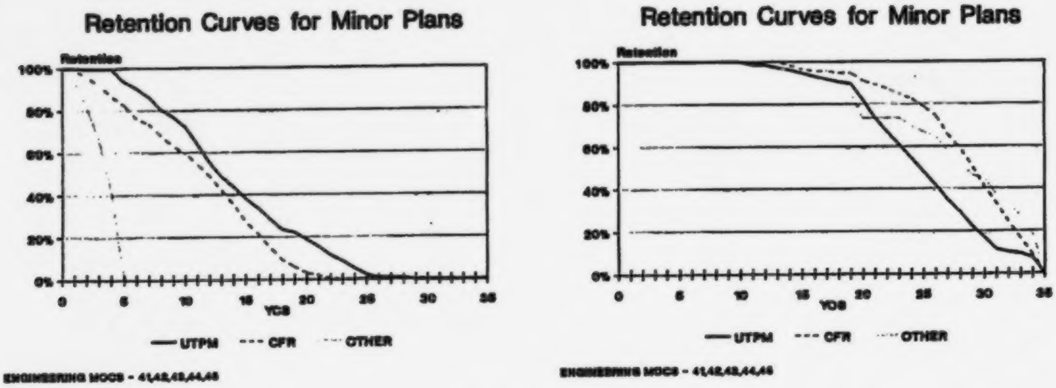


Figure E - 7: Minor Plan Retention Curves
Engineering MOCs

9. Major Plans Although ROTP attrition increased after three YCS, following obligatory service, neither DEO nor ROTP retention levelled off until the start of the IE (Figure E - 8). OCTP retention was significantly different, but the proportion of OCTP engineering officers has been negligible. On the YOS curves about 55 percent of ROTP and 60 percent of DEO engineers completed the IE. The average length of service was 14.5 YCS (18.6 YOS) for ROTP officers, 15.5 YCS (16.7 YOS) for DEO officers, and 20.8 YCS (24.3 YOS) for OCTP officers.

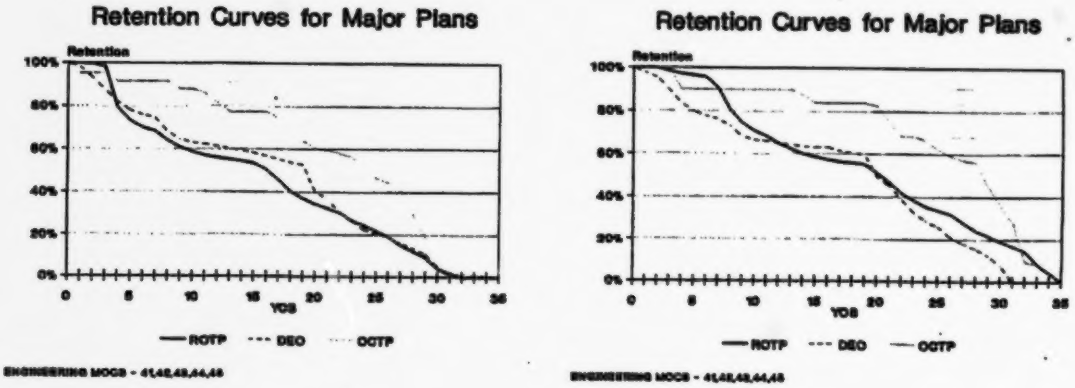
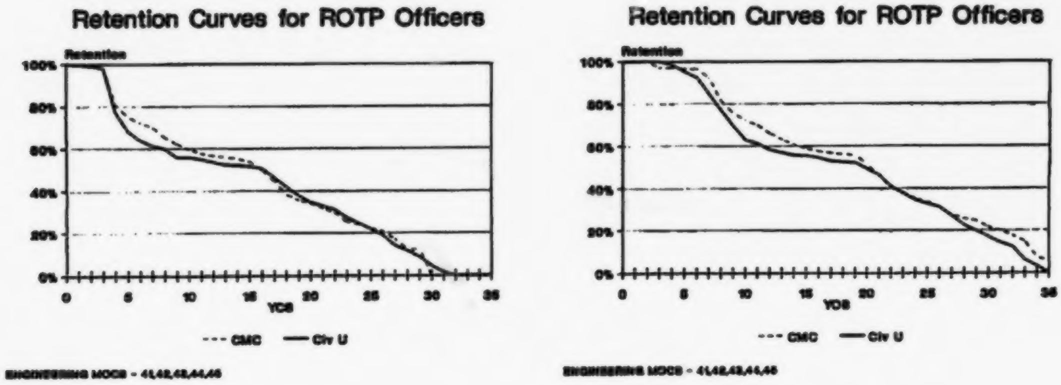


Figure E - 8: Major Plan Retention Curves
Engineering MOCs

10. ROTP - CMC/Civilian University The YCS retention curves for engineering ROTP officers are identical through obligatory service (**Figure E - 9**). Attrition for officers from civilian universities continued to be high until the retention levelled slightly between six and nine YCS under the influence of the gratuity offer. About 57 percent of CMC and 52 percent of civilian university engineering officers served through the IE, although ROTP officers from both backgrounds had similar retention patterns while on IPS. The average length of service was 14.6 YCS (19.0 YOS) for ROTP officers from CMC; for officers from civilian universities it was 14.2 YCS (17.8 YOS).



Retention Curves for ROTP Officers

Retention Curves for ROTP Officers

ENGINEERING MOCS - 41,42,43,44,46

ENGINEERING MOCS - 41,42,43,44,46

Figure E - 9: ROTP Retention Curves
Engineering MOCs

11. **Civilian University - ROTP/DEOD** Of engineering officers that attended civilian universities retention differences were significant between three and nine YCS. DEOD officers showed earlier attrition and ROTP officers responded to the offer of the gratuity at nine YCS (**Figure E - 10**). DEOD and ROTP officers had similar retention through the IE, with retention for both near 52 percent at 20 YOS. The average length of service was 14.2 YCS (15.4 YOS) for DEOD officers; for ROTP civilian university officers it was 14.2 YCS (17.8 YOS).

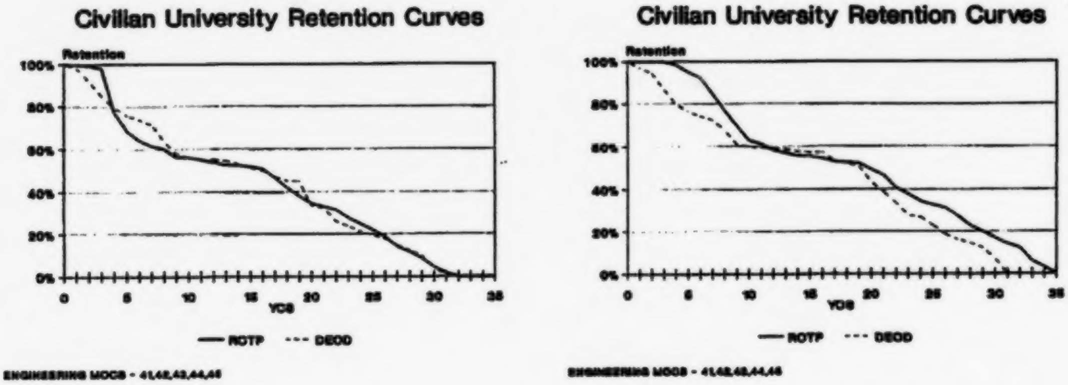
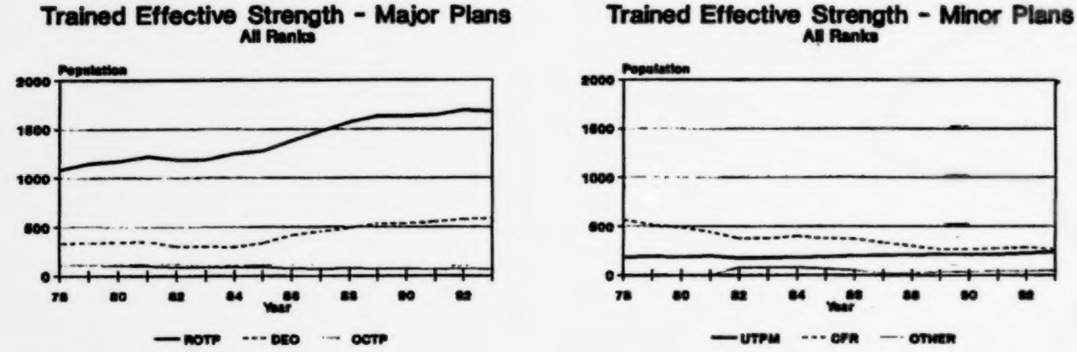


Figure E - 10: Civilian University Retention Curves Engineering MOCs

ENGINEERING OCCUPATIONS LESS MARE

Strength

1. The non-maritime engineering officer population grew by 26 percent in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in **Figure F - 1**, were:



ENGINEER MOCS LESS MARE - 41,42,43,46

ENGINEER MOCS LESS MARE - 41,42,43,46

Figure F - 1: Trained Effective Strength
All Commissioning Plans - Engineering MOCs Less MARE
Ranks - Lt to Col

a. ROTP - an increase of 55 percent, mostly since 1983;

b. DEO - an increase of 76 percent, all the growth since 1984;

c. OCTP - a continuous decrease of 43 percent, though the numbers are small;

d. UTPM - an increase of 27 percent, all since 1983;

e. CFR - a decrease of 54 percent, primarily in the periods from 1978 to 1982 and 1984 to 1989; and

f. other plans - an infinite percentage increase from none in 1978 to 36 officers by 1993.

Commissioning Plan Distribution

2. Because there were changes in the composition of the non-maritime engineering MOCs, distributions of commissioning plans over the period from 1978 to 1993 were also examined and showed:

a. for all officers:

   (1) ROTP - a proportion of 48 percent in 1978 increased smoothly to 59 percent by 1988, and levelled there,

   (2) DEO - a proportion of 15 percent in 1978 increased to 20 percent by 1993, after dropping to 13 percent in 1984,

   (3) OCTP - the small proportion of five percent in 1978 decreased to two percent by 1993, and

   (4) minor plans combined - a proportion of 33 percent in 1978 decreased to 19 percent by 1993;

b. for junior officers:

   (1) ROTP - a proportion of 46 percent in 1978 increased to 56 percent by 1993, having reached 58 percent in 1989 and 1990,

   (2) DEO - a proportion of 13 percent in 1978 increased to 23 percent by 1993, having been as low as ten percent in 1984,

   (3) OCTP - the small proportion of three percent in 1978 decreased to one percent by 1993, and

   (4) minor plans combined - a proportion of 39 percent in 1978 decreased to 20 percent by 1989, where it generally remained until 1993; and

c. for senior officers:

(1) ROTP - a proportion of 51 percent in 1978 increased to 63 percent by 1993,

(2) DEO - a proportion of 18 percent in 1978 held until 1986, then it dropped to 16 percent by 1993,

(3) OCTP - a proportion of eight percent in 1978 decreased to three percent by 1993, and

(4) minor plans combined - a proportion of 24 percent in 1978 decreased to 17 percent by 1993.

ROTP - CMC/Civilian University

3. ROTP numbers in non-maritime engineering MOCs increased by 55 percent. The change was a 101 percent increase for the CMC component whereas it was a 24 percent decrease for civilian university graduates (**Figure F - 2**). Between 1978 and 1993 CMC graduates went from representing 62 to 80 percent of ROTP non-maritime engineering officers; civilian university ROTP graduates decreased their representation from 38 to 19[1] percent.

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[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

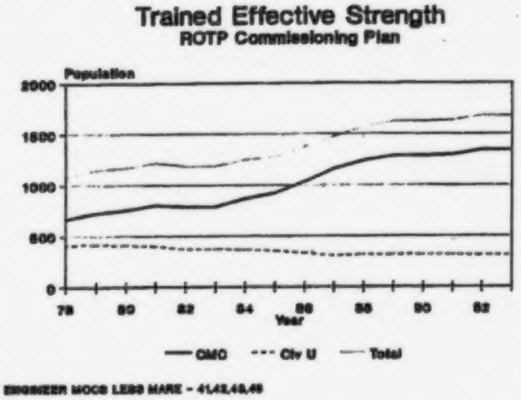


Figure F - 2: Trained Effective Strength
ROTP - Engineering MOCs Less MARE
Ranks - Lt to Col

Eligibility Rates

4. **Major Plans** OCTP does not produce many non-maritime engineers; nevertheless eligibility rates for OCTP officers have been higher than those for either DEO or ROTP (**Figure F - 3**). ROTP eligibility rates have been most consistent and have generally been the lowest. Eligibility rates for all plans have increased slightly since the 1990 FRP was introduced.

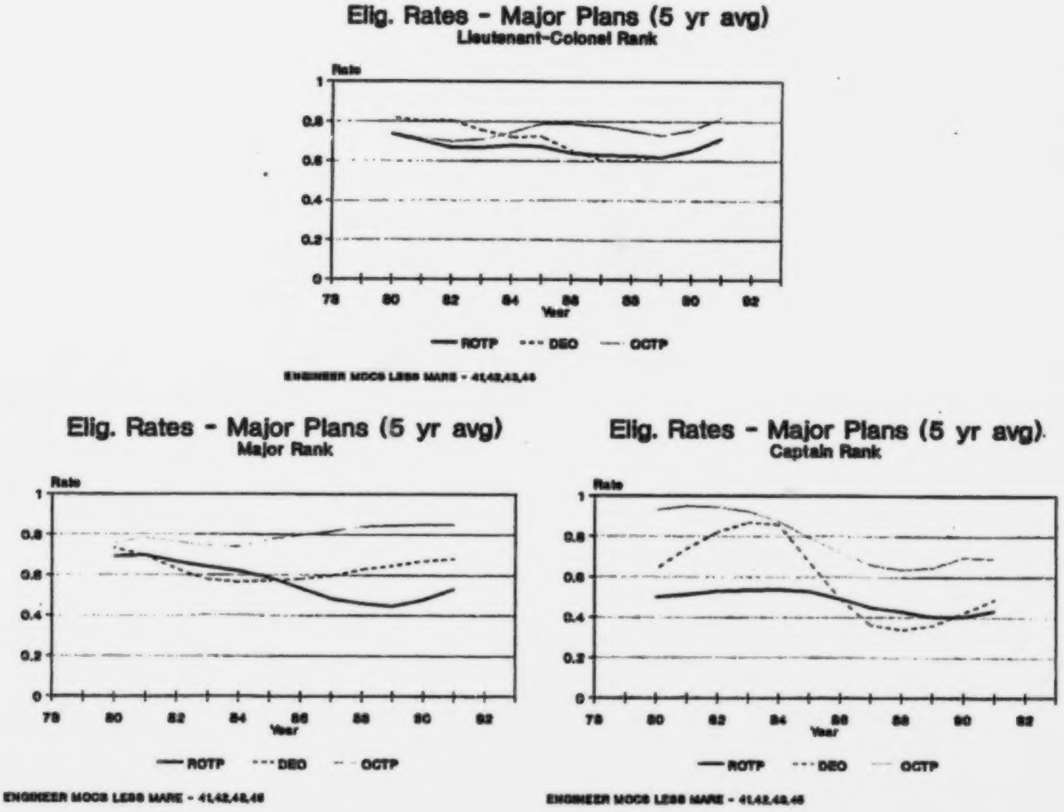
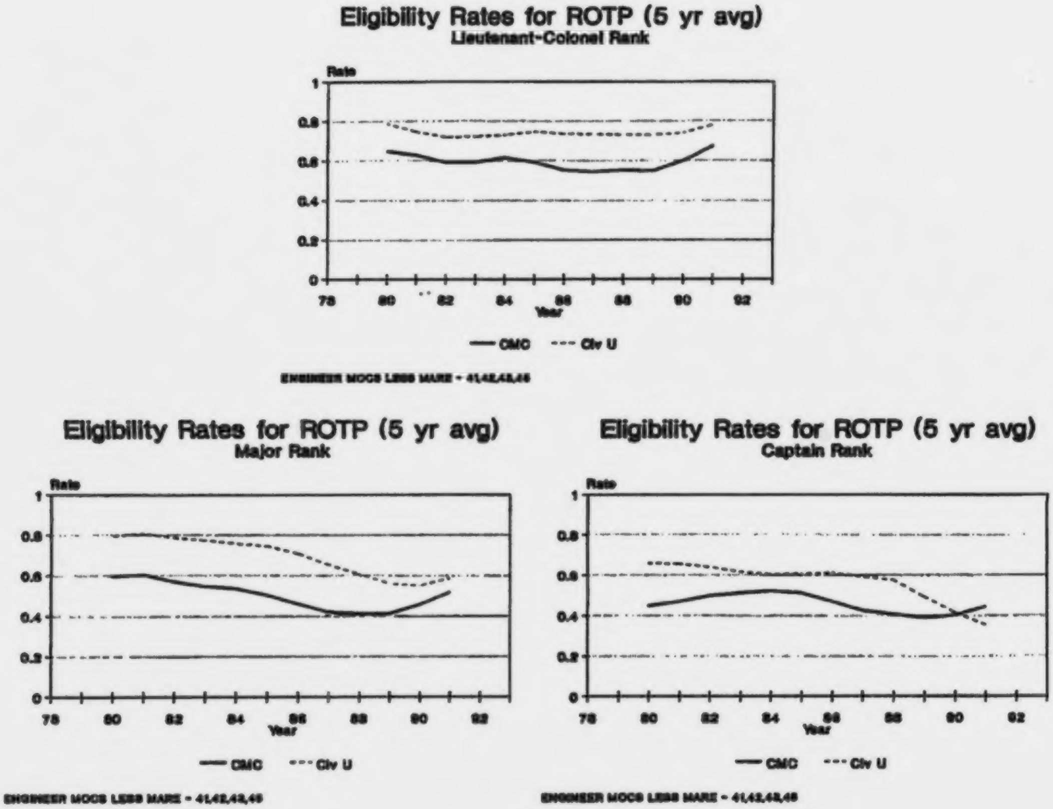


Figure F - 3: Eligibility Rates - Major Plans
5-year Moving Averages
Engineering MOCs Less MARE

5. ROTP - CMC/Civilian University In comparing ROTP eligibility rates, rates for CMC graduates have been consistently lower at all three ranks (Figure F - 4). The eligibility rates for ROTP Majs and LCols from both sources increased since the 1990 FRP introduction.



Eligibility Rates for ROTP (5 yr avg)
Lieutenant-Colonel Rank

ENGINEER MOCS LESS MARE - 41,42,43,46

Eligibility Rates for ROTP (5 yr avg)
Major Rank

ENGINEER MOCS LESS MARE - 41,42,43,46

Eligibility Rates for ROTP (5 yr avg)
Captain Rank

ENGINEER MOCS LESS MARE - 41,42,43,46

Figure F - 4: ROTP Eligibility Rates
5-year Moving Averages
Engineering MOCs Less MARE

Promotion Rates

6. **Major Plans** For the non-maritime engineers ROTP promotion rates have been generally higher, while OCTP promotion rates have been most erratic due to small numbers (**Figure F** - 5). The only significant[2] difference in promotion rates was between ROTP and DEO officers to the LCol rank. FRP influences are apparent at all ranks in the latter years.

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[2] All statements on statistical significance are tested at the 95 percent confidence level.

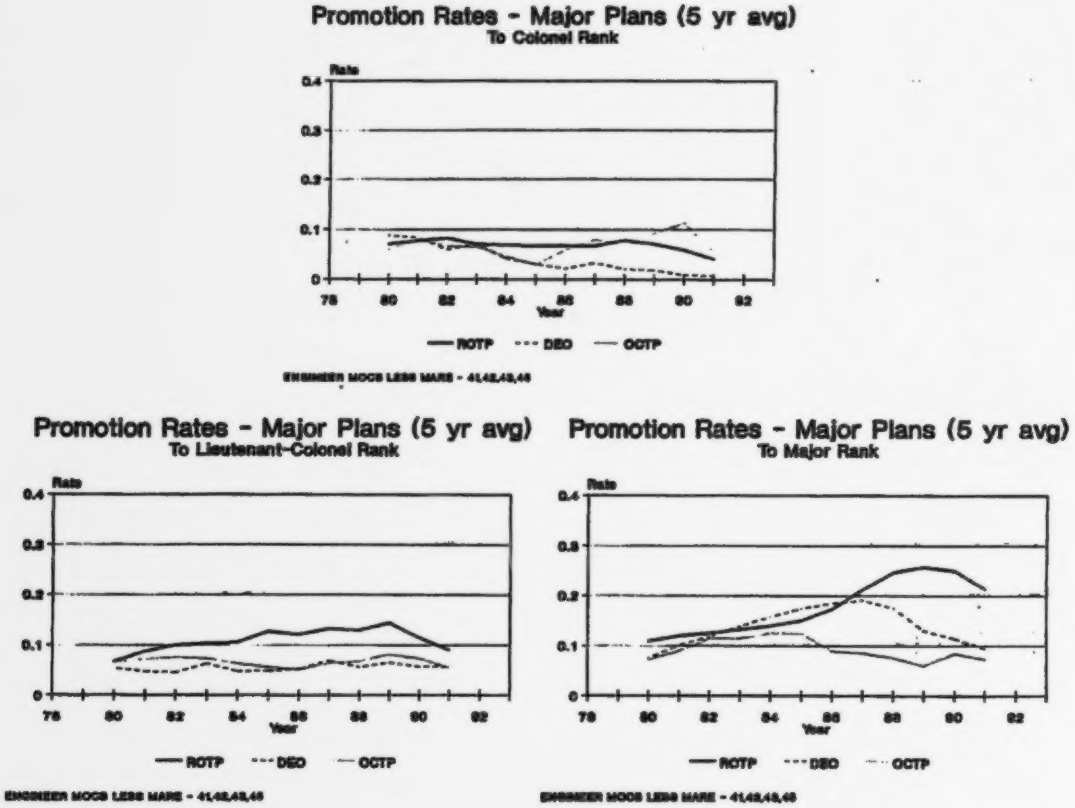


**Figure F - 5: Promotion Rates - Major Plans
5-year Moving Averages
Engineering MOCs Less MARE**

7. ROTP - CMC/Civilian University In comparing ROTP promotion rates, CMC rates were generally higher at all ranks examined, however the statistical tests on differences were inconclusive (Figure F - 6). A recent decline in rates apparent for all ROTP officers is possibly related to the FRP.

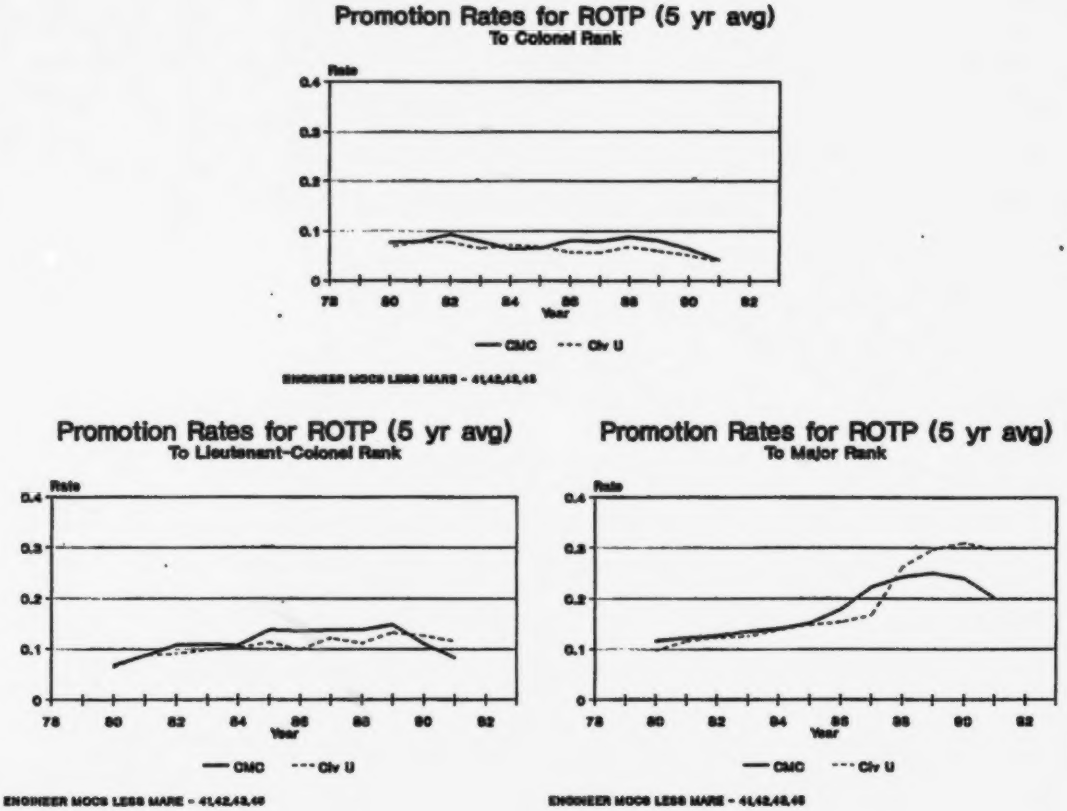


Figure F - 6: ROTP Promotion Rates
5-year Moving Averages
Engineering MOCs Less MARE

Retention

8. **Minor Plans** The minor plan retention curves for non-maritime engineering officers reveal that the average length of service was 12.8 YCS (23.8 YOS) for those commissioned under UTPM, 10.4 YCS (27.8 YOS) for CFR, and 2.7 YCS (28.8 YOS) for the 'other' plans (Figure F - 7).

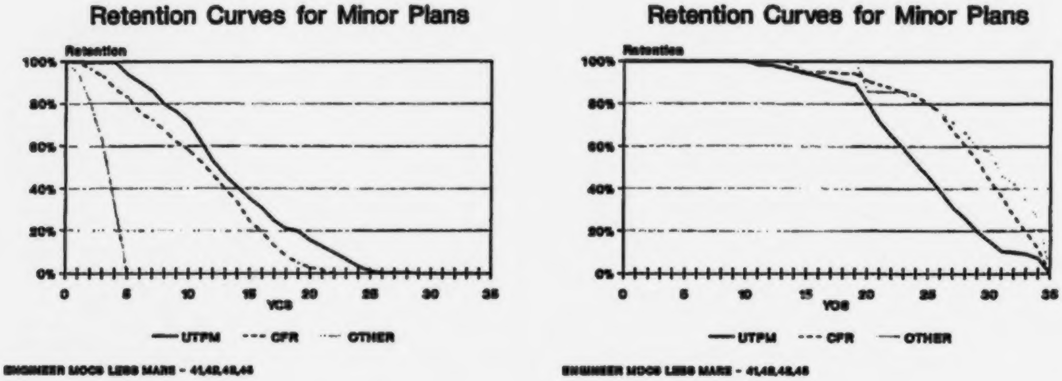


Figure F - 7: Minor Plan Retention Curves
Engineering MOCs Less MARE

9. **Major Plans** ROTP attrition increased after three YCS following obligatory service (**Figure F - 8**). After four YCS DEO retention was significantly better than that for ROTP. DEO early retention levelled off between five and seven YCS, possibly influenced by obligatory service after post-graduate courses. Increased ROTP attrition at seven YCS corresponds to ten YOS, a point where pre-OCDP officers tended to leave. DEO retention was about 65 percent, and ROTP retention about 57 percent to the end of the IE at 20 YOS. All three plans showed increased attrition at the start of the IPS, but DEO attrition rates were the greatest. The OCTP curve revealed little because of small numbers, but there was significantly different retention. For non-maritime engineering officers commissioned under ROTP the average length of service was 14.9 YCS (19.2 YOS), 16.4 YCS (17.7 YOS) for DEO, and 23.4 YCS (26.9 YOS) for OCTP.

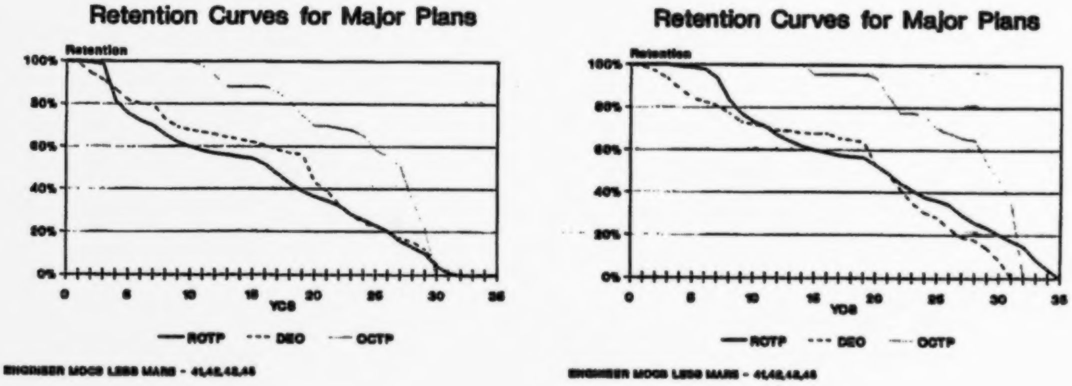


**Figure F - 8: Major Plan Retention Curves
Engineering MOCs Less MARE**

10. ROTP - CMC/Civilian University The YCS retention curves for non-maritime ROTP engineers are similar for the initial period of obligatory service, but CMC officer retention was better until 15 YCS, and throughout on the YOS curves (**Figure F - 9**). Retention of officers from civilian universities was significantly lower when it levelled off slightly between seven and eight YCS, possibly to accept the offered gratuity. About 57 percent of CMC and 51 percent of civilian university officers served through the IE, and both YCS and YOS curves indicate similar IPS retention. The average length of service was 14.8 YCS (19.6 YOS) for CMC officers, and 14.1 YCS (17.9 YOS) for civilian university ROTP officers.

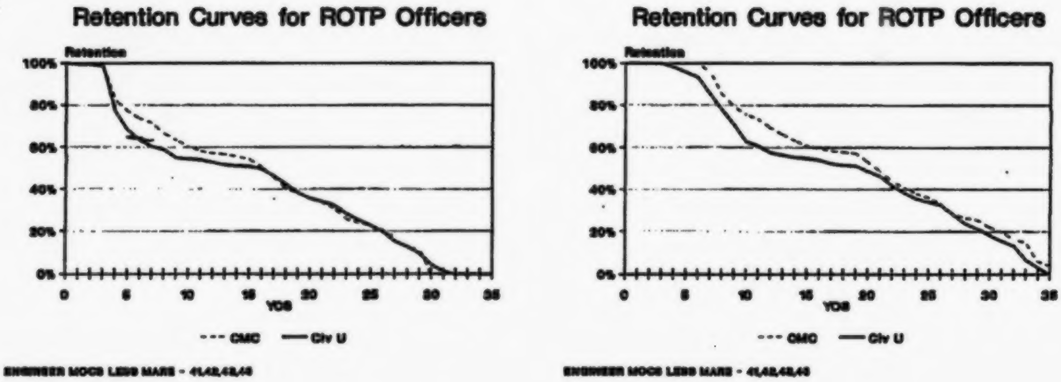
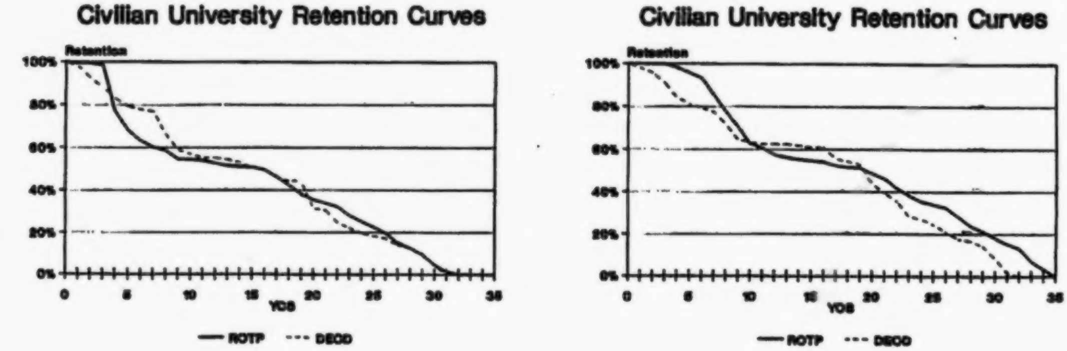


**Figure F - 9: ROTP Retention Curves
Engineering MOCs Less MARE**

11. **Civilian University - *ROTP/DEOD*** *Of those* non-maritime engineering officers that attended civilian universities, **DEOD** officers showed earlier attrition than did ROTP, but only ROTP officers responded to the nine YCS gratuity (**Figure F - 10**). About 53 percent of DEOD and 51 percent of ROTP officers completed 20 YOS, then DEOD retention subsided. The average length of service was 14.1 YCS (17.9 YOS) for civilian university ROTP officers and 14.4 YCS (16.2 YOS) for DEOD officers.



Civilian University Retention Curves

ENGINEER MOCS LESS MARE - 41,42,43,46

Civilian University Retention Curves

ENGINEER MOCS LESS MARE - 41,42,43,46

Figure F - 10: Civilian University Retention Curves
Engineering MOCs Less MARE

SUPPORT OCCUPATIONS

Strength

1. The population of officers in the support MOCs grew by 41 percent in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in Figure G - 1, were:

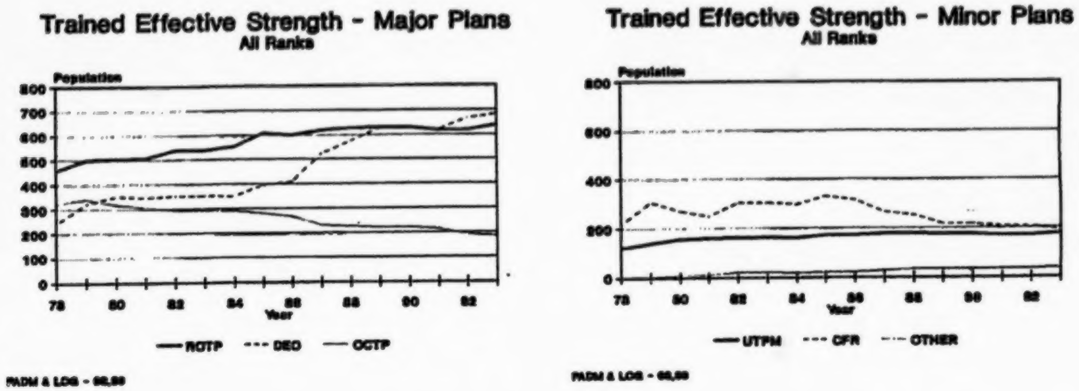


**Figure G - 1: Trained Effective Strength
All Commissioning Plans - Support MOCs
Ranks - Lt to Col**

a. ROTP - an increase of 40 percent over the period, with most of it occurring prior to 1985;

b. DEO - an increase of 183 percent, most of it having taken place since 1986;

c. OCTP - a decrease of 43 percent over the period, mostly between 1983 and 1987;

d. UTPM - an increase of 48 percent over the period, with most of it from 1978 to 1980;

e. CFR - a decrease of 12 percent over the whole period, but having increased by over 50 percent by 1985; and

f. other plans - an infinite percentage increase from none in 1978 to 36 officers by 1993.

Commissioning Plan Distribution

2. Because there were changes in the composition of the support MOCs, commissioning plan distributions in the period from 1978 to 1993 were also examined and showed:

a. for all officers:

   (1) ROTP - a proportion of 34 percent in 1978, decreased to 31 percent in 1979, increased to 33 percent by 1985 and has since remained at that level,

   (2) DEO - a proportion of 18 percent in 1978 increased smoothly to 36 percent by 1993,

   (3) OCTP - a proportion of 24 percent in 1978 decreased to a proportion of 10 percent by 1993, and

   (4) minor plans combined - a proportion of 24 percent in 1978 decreased to 21 percent by 1993, having been as high as 29 percent in 1982/83;

b. for junior officers:

   (1) ROTP - a proportion of 39 percent in 1978 decreased to 28 percent by 1993,

   (2) DEO - a proportion of 13 percent in 1978 more than tripled to 44 percent by 1993,

   (3) OCTP - a proportion of 20 percent in 1978 decreased to seven percent by 1993, having been as low as four percent in 1987, and

   (4) minor plans combined - a proportion of 28 percent in 1978 decreased to 21 percent by 1993, having been as high as 35 percent between 1982 and 1986; and

c. for senior officers all changes in distributions occurred smoothly between 1978 and 1993:

(1) ROTP - a proportion of 22 percent doubled to 44 percent,

(2) DEO - a proportion of 28 percent decreased to 21 percent,

(3) OCTP - a proportion of 33 percent decreased to 15 percent, and

(4) minor plans combined - a proportion of 17 percent increased to 20 percent.

ROTP - CMC/Civilian University

3. ROTP numbers in the support MOCs increased by 40 percent. Whereas the number of ROTP officers from both sources was about equal until 1984, between 1978 and 1993 the increase was 73 percent for the CMC component while it was only one percent for graduates from civilian universities (**Figure G - 2**). Over the full period CMC graduates went from representing 51 to 64 percent of ROTP support officers; civilian university ROTP graduates decreased their representation from 48[1] to 35[1] percent.

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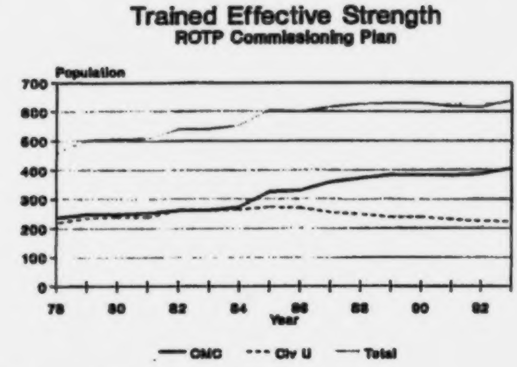
[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.



PADM & LOG - 93,09

Figure G - 2: Trained Effective Strength
ROTP - Support MOCs
Ranks - Lt to Col

Eligibility Rates

4. **Major Plans** Eligibility rates for OCTP officers in the support MOCs have generally been higher at the Capt and Maj ranks, and on par with DEO at the LCol rank. The ROTP eligibility rates have been the lowest except at the Capt rank. ROTP Capt eligibility has been fairly constant, while DEO and OCTP rates have decreased since 1984 (**Figure G - 3**).

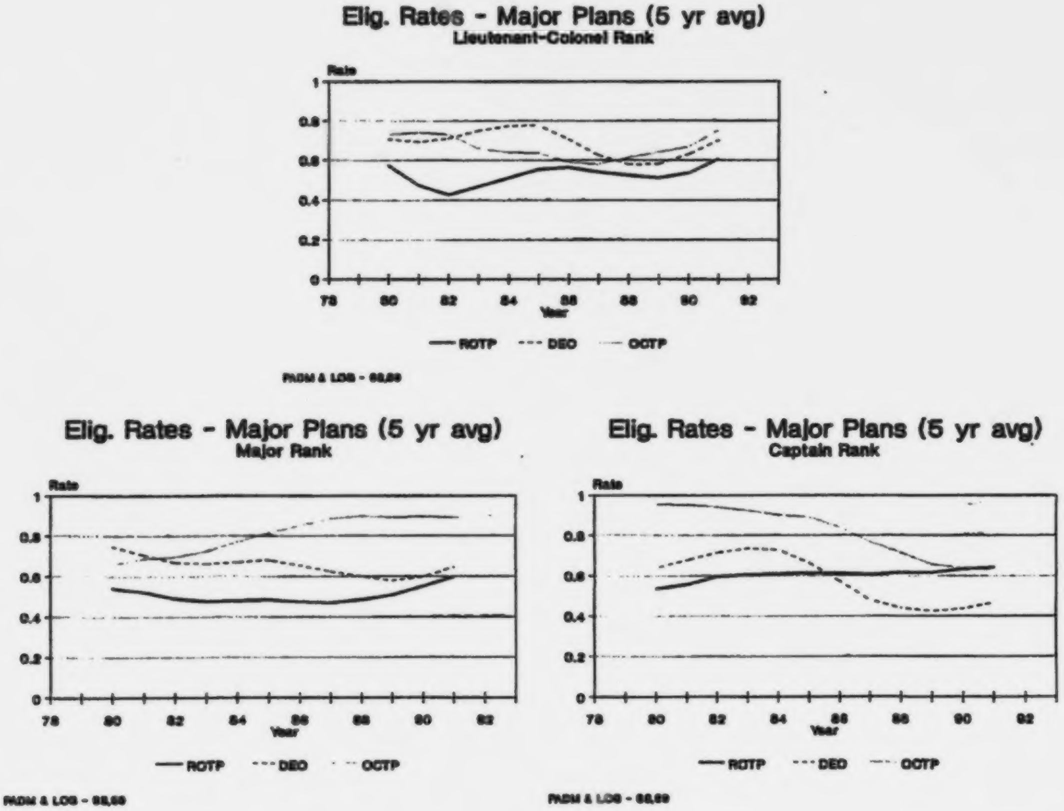
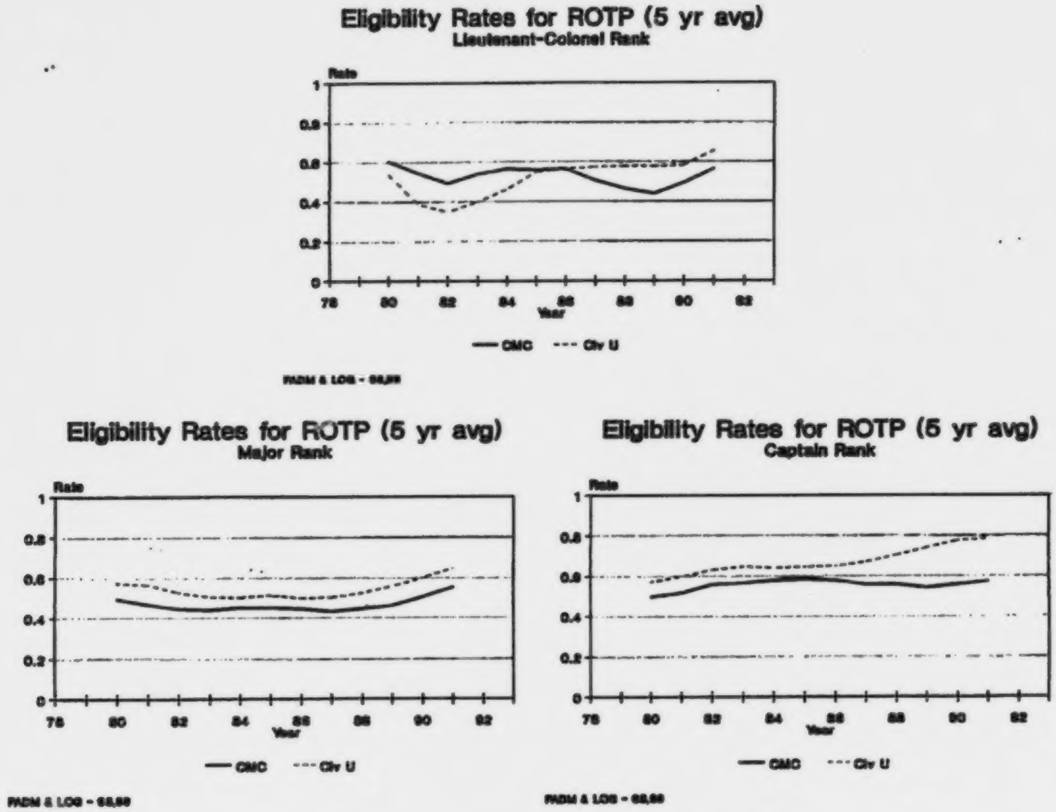


Figure G - 3: Eligibility Rates - Major Plans
5-year Moving Averages
Support MOCs

5. ROTP - CMC/Civilian University Eligibility rates for CMC graduates have been consistently lower at the Capt and Maj ranks (Figure G - 4). LCol eligibility rates were lower for officers from civilian universities prior to 1985 and for CMC graduates since 1986.



FADM & LOG - 88,89

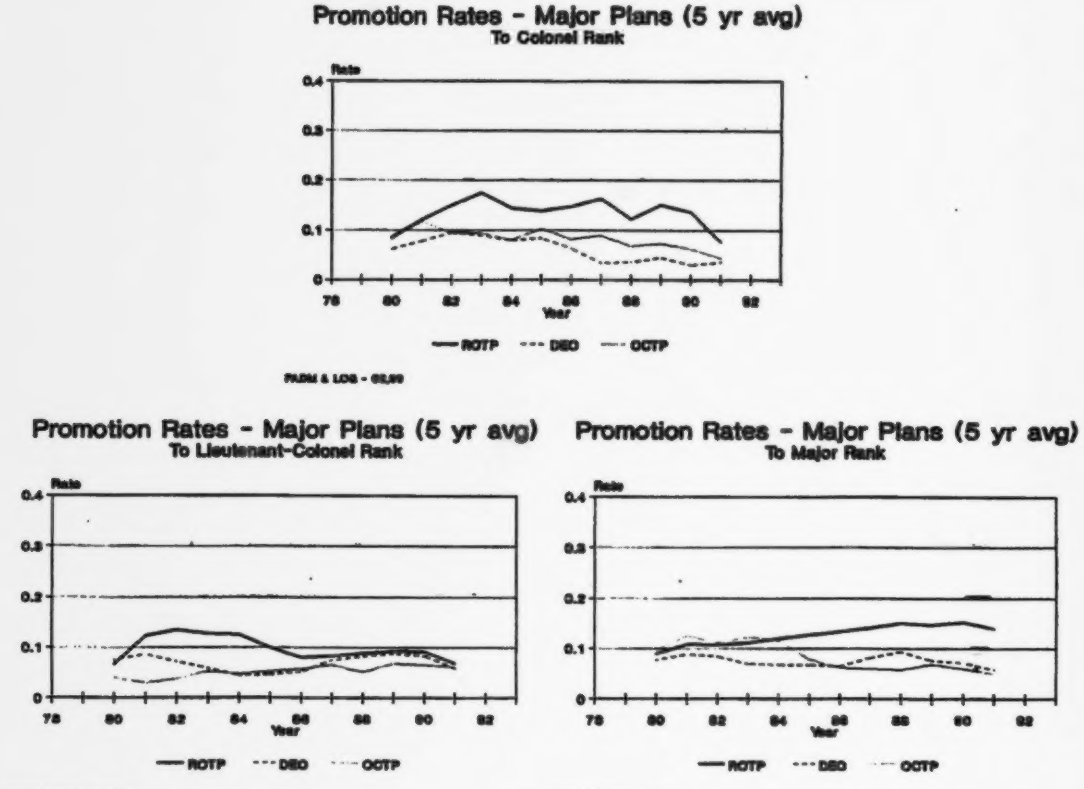
FADM & LOG - 88,89

FADM & LOG - 88,89

Figure G - 4: ROTP Eligibility Rates
5-year Moving Averages
Support MOCs

Promotion Rates

6. **Major Plans** ROTP promotion rates for officers in the support MOCs have generally been the highest (**Figure G - 5**). The differences were significant[2] for promotion rates to the rank of Maj.



PADM & LOG - 88,89

PADM & LOG - 88,89

PADM & LOG - 88,89

Figure G - 5: Promotion Rates - Major Plans
5-year Moving Averages
Support MOCs

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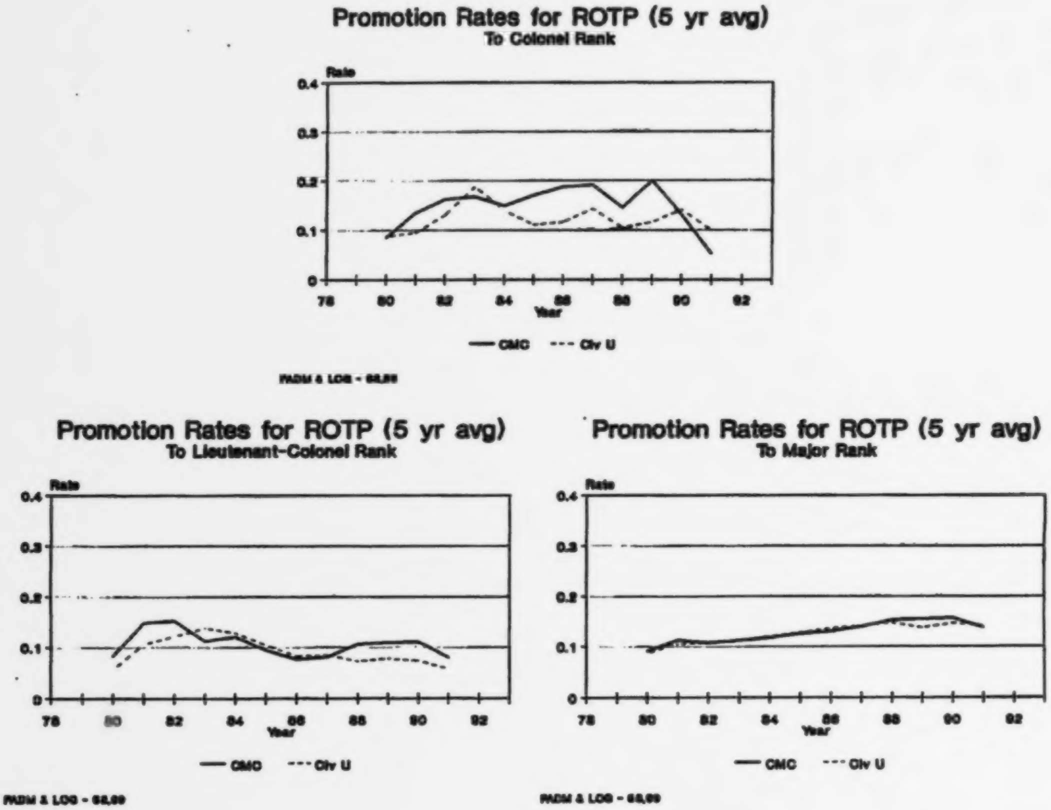
[2] All statements on statistical significance are tested at the 95 percent confidence level.

7. ROTP - CMC/Civilian University Civilian university and CMC promotion rates to all ranks examined for officers in the support MOCs have been similar (Figure G - 6). The effects of the FRP are visible at all ranks as a drop in promotion rates since 1990.



Promotion Rates for ROTP (5 yr avg)
To Colonel Rank

PADM & LOG - 88,89

Promotion Rates for ROTP (5 yr avg)
To Lieutenant-Colonel Rank

PADM & LOG - 88,89

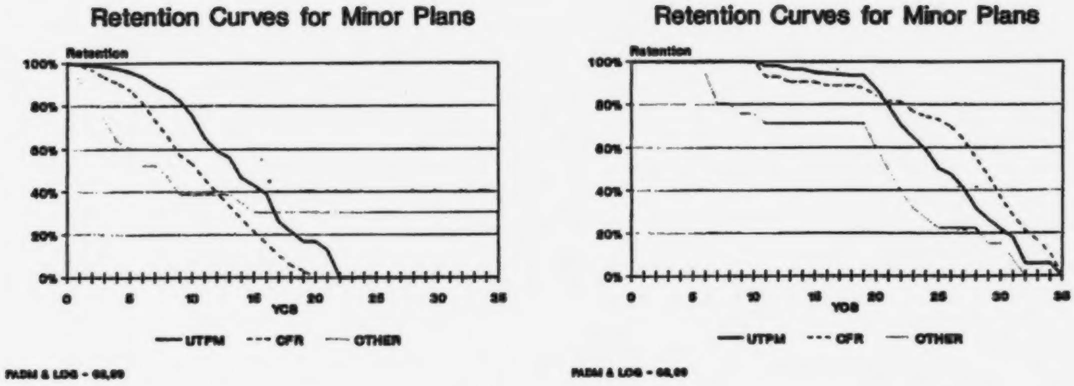
Promotion Rates for ROTP (5 yr avg)
To Major Rank

PADM & LOG - 88,89

Figure G - 6: ROTP Promotion Rates
5-year Moving Averages
Support MOCs

Retention

8. **Minor Plans** The minor plan retention curves reveal that in the support MOCs the average length of service was 13.2 YCS (24.7 YOS) for officers commissioned under UTPM and 10.0 YCS (26.3 YOS) for CFR (**Figure G - 7**). There were too few officers from 'other' plans for analysis.



PADM & LOG - 88,89

PADM & LOG - 88,89

Figure G - 7: Minor Plan Retention Curves
Support MOCs

9. **Major Plans** ROTP attrition increased in the YCS plot following obligatory service, but between nine and 16 YCS, retention of officers from the support MOCs for all three plans was indistinguishable (**Figure G - 8**). The average length of service was 15.0 YCS (18.5 YOS) for ROTP officers, 16.2 YCS (17.2 YOS) for DEO, and 15.9 YCS (16.5 YOS) for OCTP.

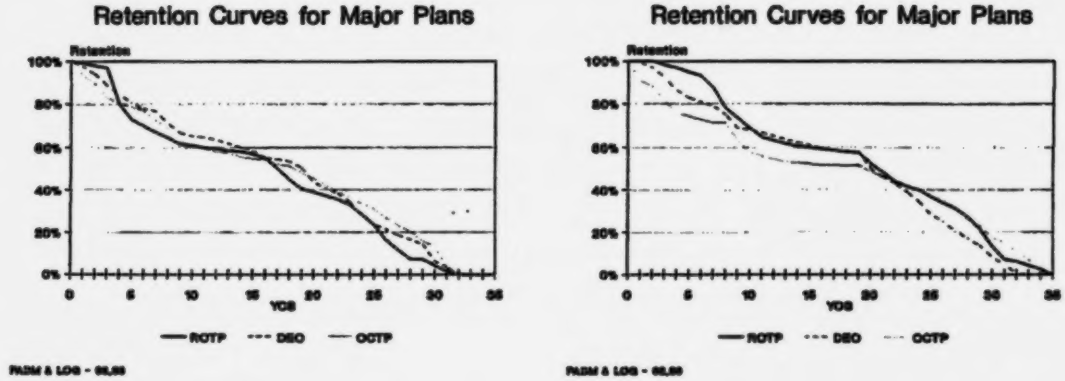
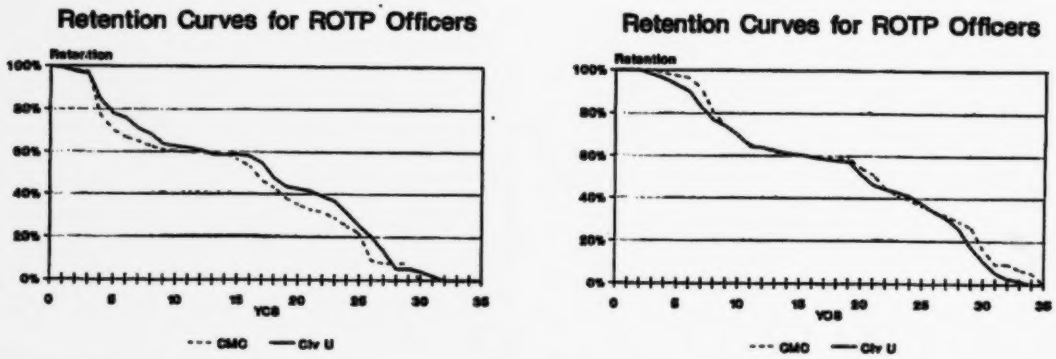


Figure G - 8: Major Plan Retention Curves Support MOCs

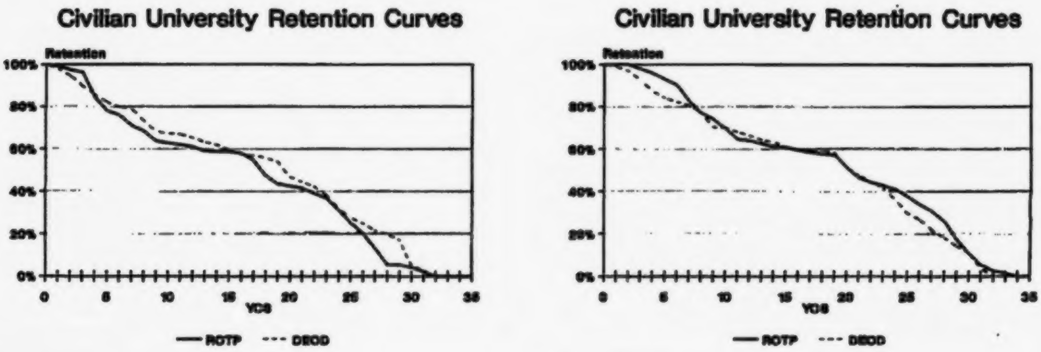
10. ROTP - CMC/Civilian University The YCS retention curves for ROTP officers from the support MOCs are similar for the first three YCS, but CMC attrition rates following obligatory service were higher (**Figure G - 9**). Officer retention from both backgrounds converged around nine YCS. Retention levels at 20 YOS were about 59 percent for CMC and about 58 percent for civilian university officers. The YOS curves indicate that officers from civilian universities had slightly higher post-IPS attrition than CMC officers. The average length of service was 14.4 YCS (18.9 YOS) for CMC officers; and for civilian university ROTP officers it was 15.7 YCS (18.2 YOS).



PADM & LOG - 92,93 PADM & LOG - 92,93

Figure G - 9: ROTP Retention Curves Support MOCs

11. Civilian University - ROTP/DEOD Of those officers in the support MOCs that attended civilian universities significantly different retention patterns were observed for the early period: DEOD officers showed earlier attrition while ROTP officers had higher attrition following obligatory service. From then on retention was almost identical (**Figure G - 10**). The average length of service was 16.8 YCS (17.5 YOS) for DEOD officers and 15.7 YCS (18.2 YOS) for civilian university ROTP officers.



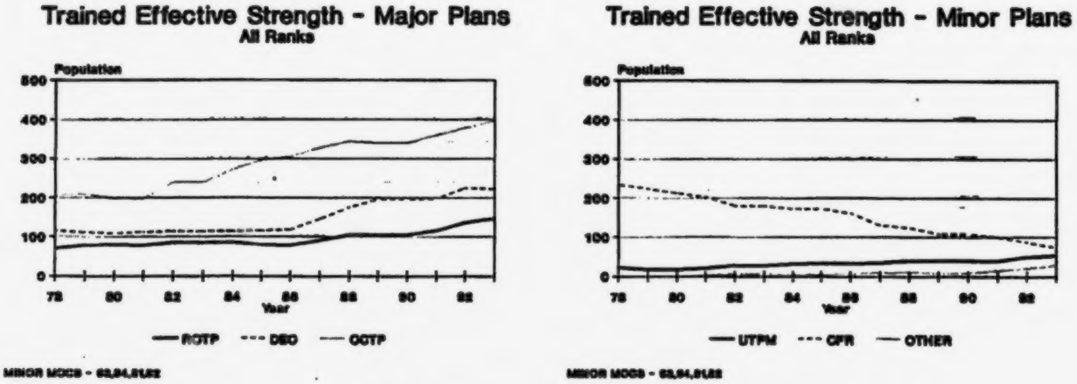
PADM & LOG - 88,89 PADM & LOG - 88,89

Figure G - 10: Civilian University Retention Curves Support MOCs

MINOR OCCUPATIONS

Strength

1. The population of officers in the minor MOCs grew by 43 percent in the period from 1978 to 1993. For individual commissioning plan populations the changes, as illustrated in Figure H - 1, were:



Trained Effective Strength - Major Plans
All Ranks

Trained Effective Strength - Minor Plans
All Ranks

Figure H - 1: Trained Effective Strength
All Commissioning Plans - Minor MOCs
Ranks - Lt to Col

a. ROTP - an increase of 107 percent over the period, mostly since 1986;

b. DEO - an increase of 93 percent, most of it having taken place since 1986;

c. OCTP - an increase of 94 percent over the period, the increase coming after a stable period from 1978 to 1981;

d. UTPM - an increase of 145 percent over the period, but small numbers are involved;

e. CFR - a decrease of 68 percent over the period; and

f. other plans - an infinite percentage increase due to an introduction of three officers in 1981, reaching a strength of 30 by 1993.

Commissioning Plan Distribution

2. Because there were changes in the composition of the minor MOCs, commissioning plan distributions in the period from 1978 to 1993 were also examined and showed:

a. for all officers:

 (1) ROTP - a proportion of 11 percent in 1978 and 1986 increased to 16 percent by 1993,

 (2) DEO - a proportion of 18 percent in 1978 increased to 24 percent by 1993, having been 17 percent between 1984 and 1986,

 (3) OCTP - a proportion of 32 percent in 1978 increased to 43 percent by 1993 with a high of 45 percent in 1987, and

 (4) minor plans combined - a proportion of 39 percent in 1978 decreased to 17 percent by 1993;

b. for junior officers:

 (1) ROTP - a proportion of 12 percent in 1978 eventually increased to 14 percent by 1993, but the figures varied through the period reaching a low of eight percent,

 (2) DEO - a proportion of 16 percent in 1978 increased to 26 percent by 1993, having been as low as 15 percent in 1985,

 (3) OCTP - a proportion of 31 percent in 1978 increased to 45 percent by 1993, having been as high as 50 percent in 1987, and

 (4) minor plans combined - a proportion of 41 percent in 1978 decreased to 15 percent by 1989, where it remained until 1993; and

c. for senior officers:

(1) ROTP - a proportion of nine percent in 1978 increased to 20 percent by 1987, where it remained,

(2) DEO - a proportion of 22 percent in 1978 decreased to 20 percent by 1993, with lows of 18 percent in 1982/83 and 1991/92,

(3) OCTP - a proportion of 32 percent in both 1978 and 1993, with a low of 28 percent in the middle of the period, and

(4) minor plans combined - a proportion of 37 percent in 1978 decreased from a high of 42 percent in 1980/81 to 22 percent by 1993.

ROTP - CMC/Civilian University

3. The number of ROTP officers in the minor MOCs increased by 104 percent; the CMC component increased by 182 percent and the civilian university component increased by 30 percent (**Figure H - 2**). Between 1978 and 1993, CMC graduates went from representing 48 to 65 percent of ROTP officers in the minor MOCs; civilian university ROTP graduates decreased their representation from 52 to 33[1] percent.

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[1] Total is less than 100 percent where uncertain or missing university type data has not yet been validated/corrected by the individual officer.

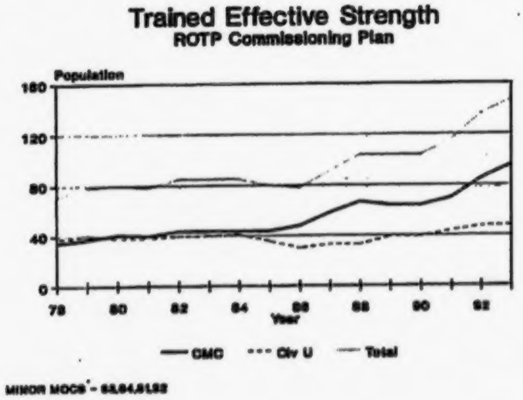

Figure H - 2: Trained Effective Strength
ROTP - Minor MOCs
Ranks - Lt to Col

Eligibility Rates

4. **Major Plans** Between 1980 and 1985 eligibility rates for DEO officers in the minor MOCs were generally higher than those for OCTP and ROTP at the Capt and LCol ranks. DEO Eligibility rates dropped below the OCTP and ROTP rates between 1986 and 1991. ROTP eligibility rates were generally lowest at the Maj rank (**Figure H - 3**).

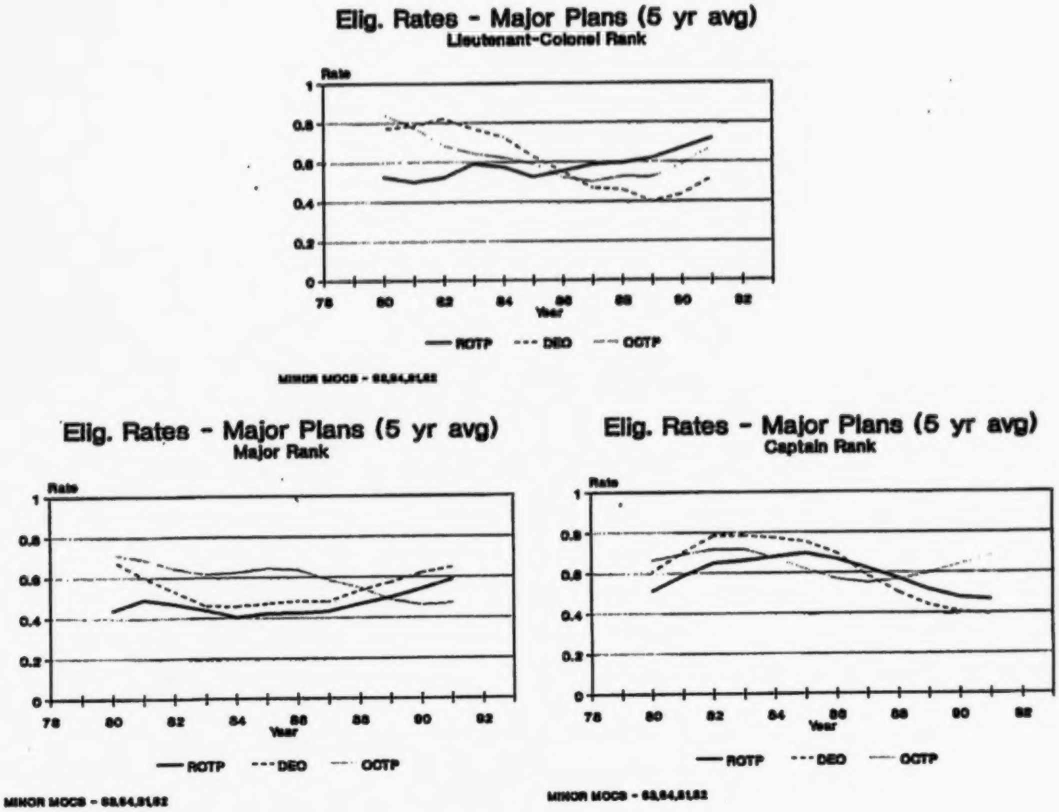

**Figure H - 3: Eligibility Rates - Major Plans
5-year Moving Averages
Minor MOCs**

5. ROTP - CMC/Civilian University Eligibility rates at the Capt and Maj ranks for CMC and civilian university graduates were comparable over the first half of the period, but the rates for CMC graduates were lower thereafter (Figure H - 4). Conversely, the CMC rates have been consistently higher at LCol rank.

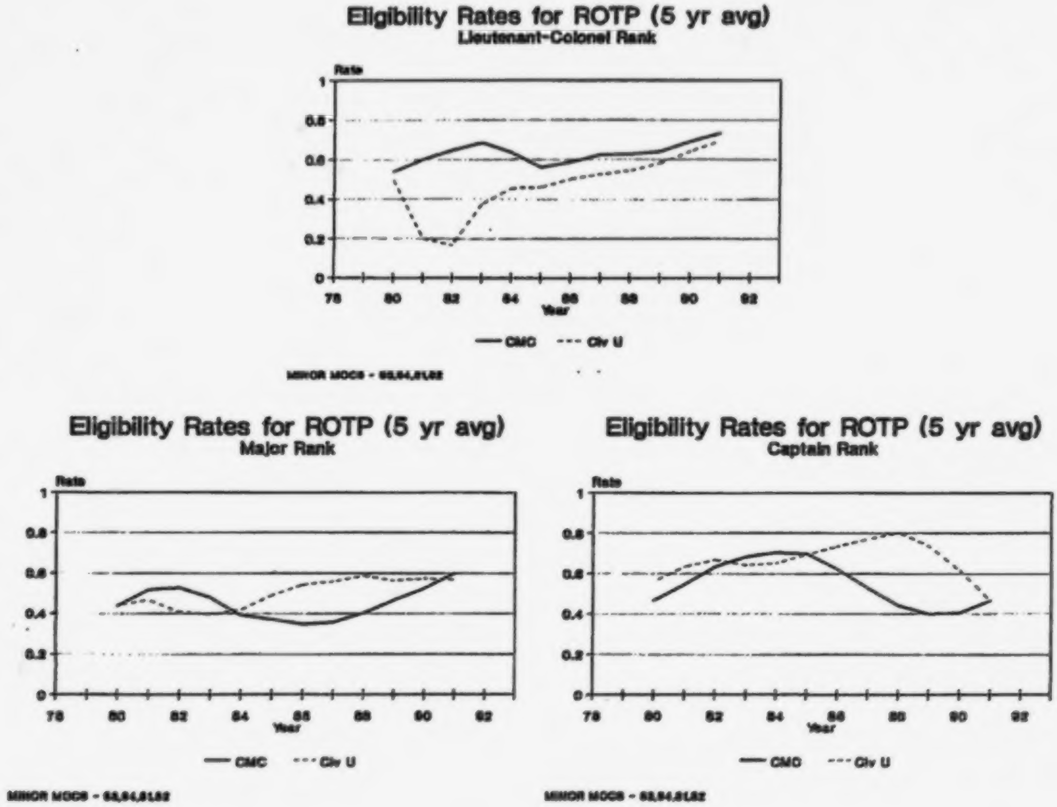

Figure H - 4: ROTP Eligibility Rates
5-year Moving Averages
Minor MOCs

Promotion Rates

6. **Major Plans** Except to the Col rank where the number of promotions for officers in the minor MOCs was too small to be meaningful, ROTP promotion rates have generally been the highest and OCTP rates the lowest (**Figure H - 5**). The differences were significant[2] for promotion rates to the Maj rank.

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[2] All statements on statistical significance are tested at the 95 percent confidence level.

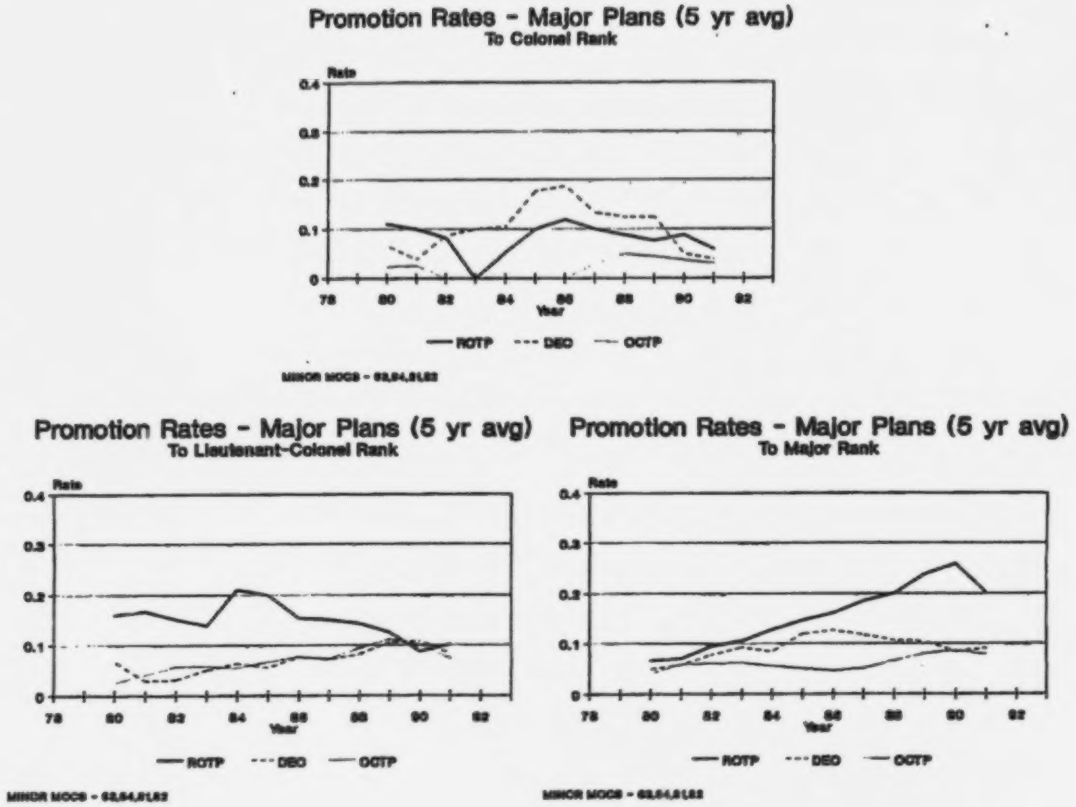

Figure H - 5: Promotion Rates - Major Plans
5-year Moving Averages
Minor MOCs

7. ROTP - CMC/Civilian University Where the number of officers promoted warranted analysis, CMC promotion rates to the Maj and LCol ranks were generally higher. However statistical tests conducted on differences were inconclusive (**Figure H - 6**).

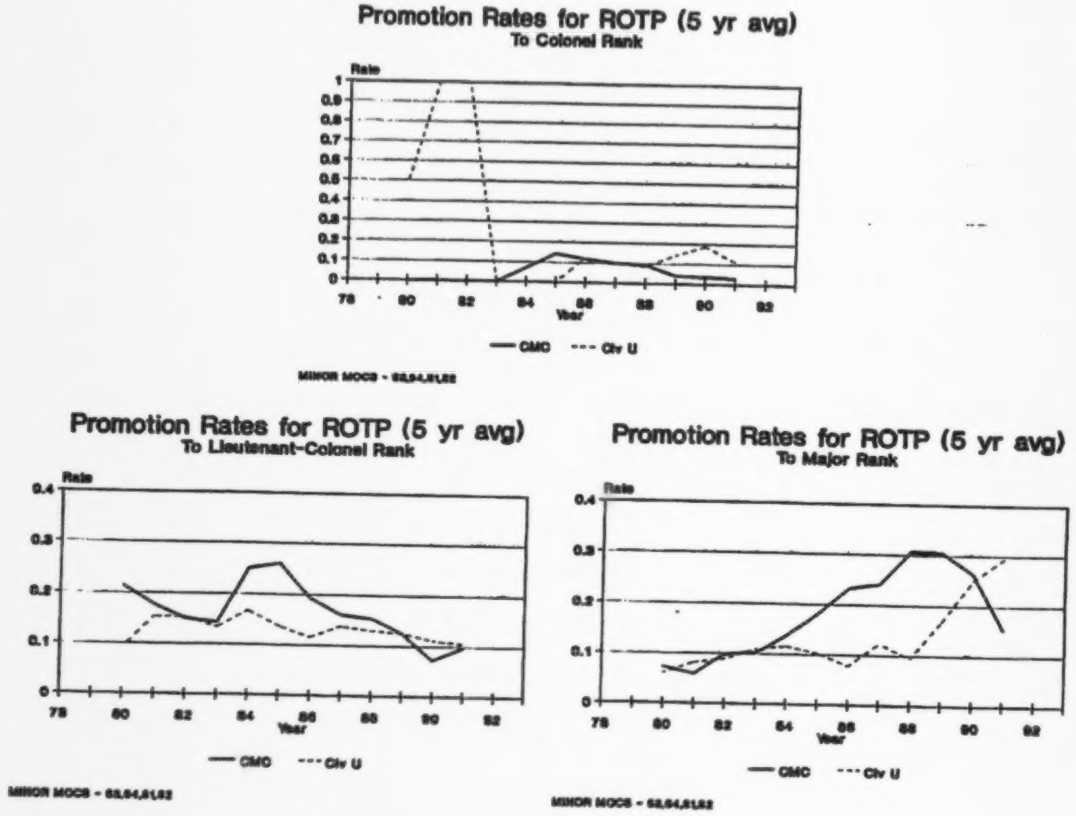

**Figure H - 6: ROTP Promotion Rates
5-year Moving Averages
Minor MOCs**

Retention

8. **Minor Plans** The minor plan retention curves provide little meaningful information as too few officers in the minor MOCs have been commissioned under UTPM or the 'other' plans. The average length of service for CFR officers was 13.0 YCS (29.2 YOS) (**Figure H - 7**).

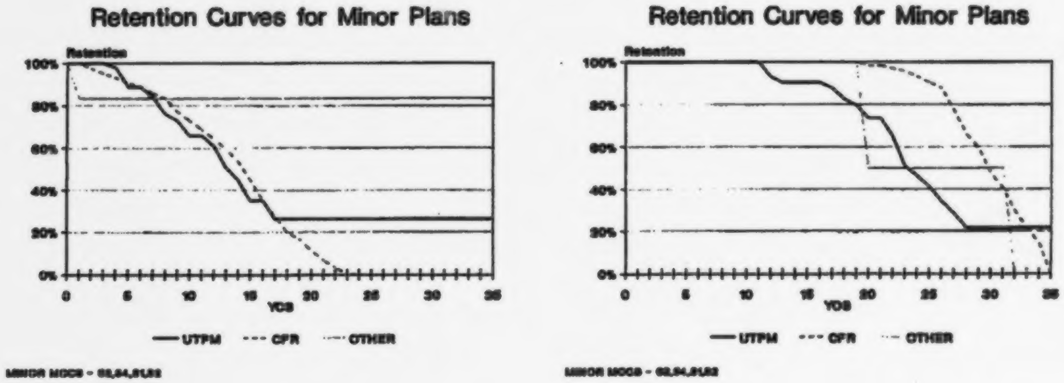

**Figure H - 7: Minor Plan Retention Curves
Minor MOCs**

9. Major Plans ROTP officer attrition increased following obligatory service, but retention levelled off going into the IE (**Figure H - 8**). DEO and OCTP attrition rates were initially lower and similar; OCTP retention was slightly higher throughout. The average length of service was 16.1 YCS (19.5 YOS) for ROTP officers, 13.8 YCS (15.9 YOS) for DEO, and 18.2 YCS (20.2 YOS) for OCTP.

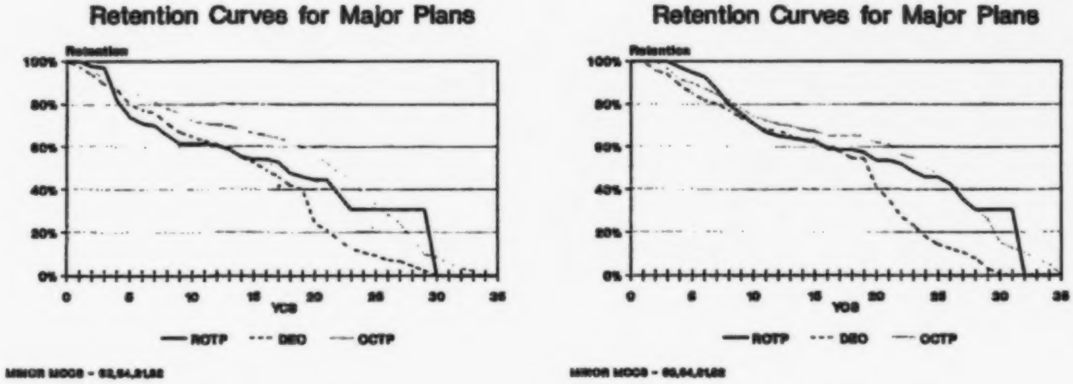

**Figure H - 8: Major Plan Retention Curves
Minor MOCs**

10. ROTP - CMC/Civilian University The number of ROTP officers in the minor MOCs has always been low, never above 50 officers until 1986 so retention curves here are meaningless (**Figure H - 9**). The average length of service was 17.0 YCS (21.1 YOS) for CMC graduates, and 16.1 YCS (19.9 YOS) for ROTP officers from civilian universities.

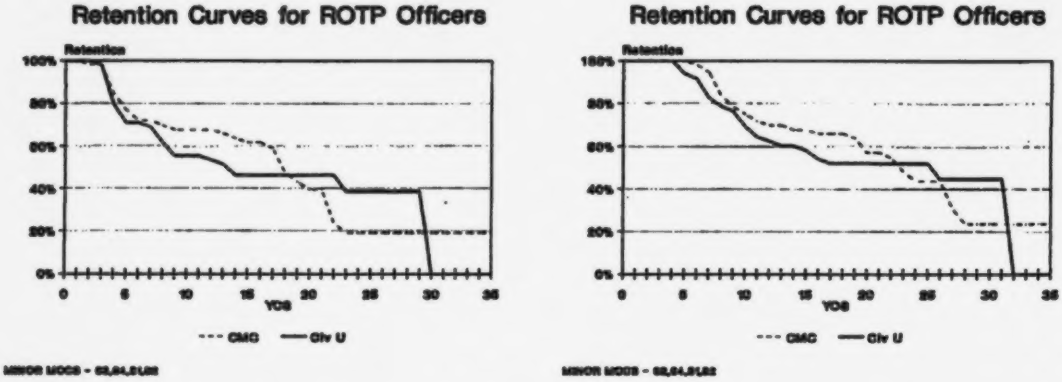

**Figure H - 9: ROTP Retention Curves
Minor MOCs**

11. Civilian University - ROTP/DEOD Insufficient data were available for analysis of those officers in the minor MOCs that attended civilian universities (Figure H - 10).

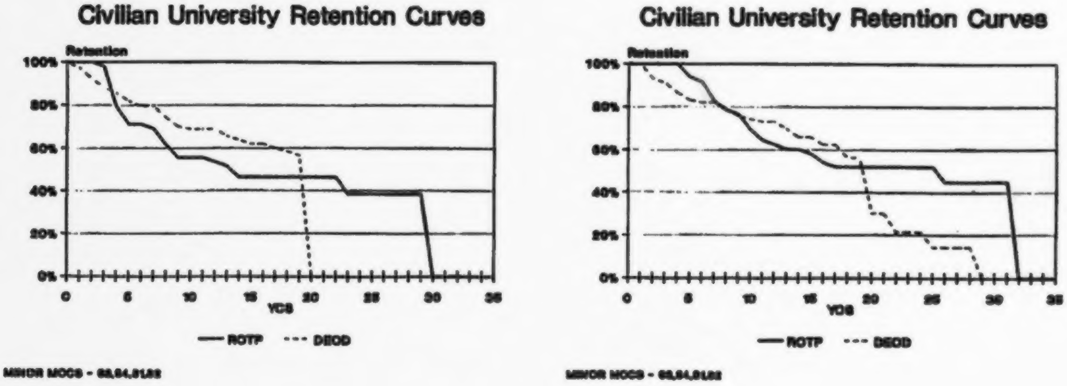

Figure H - 10: Civilian University Retention Curves
Minor MOCs

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The Minister of National Defence created the "Committee on the Canadian Military Colleges" to examine the return on investment for the Canadian Forces (CF) of the Canadian Military College (CMC) system. The Directorate of Manpower Analysis was tasked to analyze officer career progression and retention in specific military occupations (MOCs) according to the commissioning plan by which the serving officer joined the regular force component.

This project report is broken into three volumes. Volume I contains the detailed analysis of CF officers as a whole followed by a discussion on the overall study results. Volume II contains the detailed analysis of each of the MOC groups examined, and Volume III contains the detailed analysis of each of the individual MOCs studied.

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